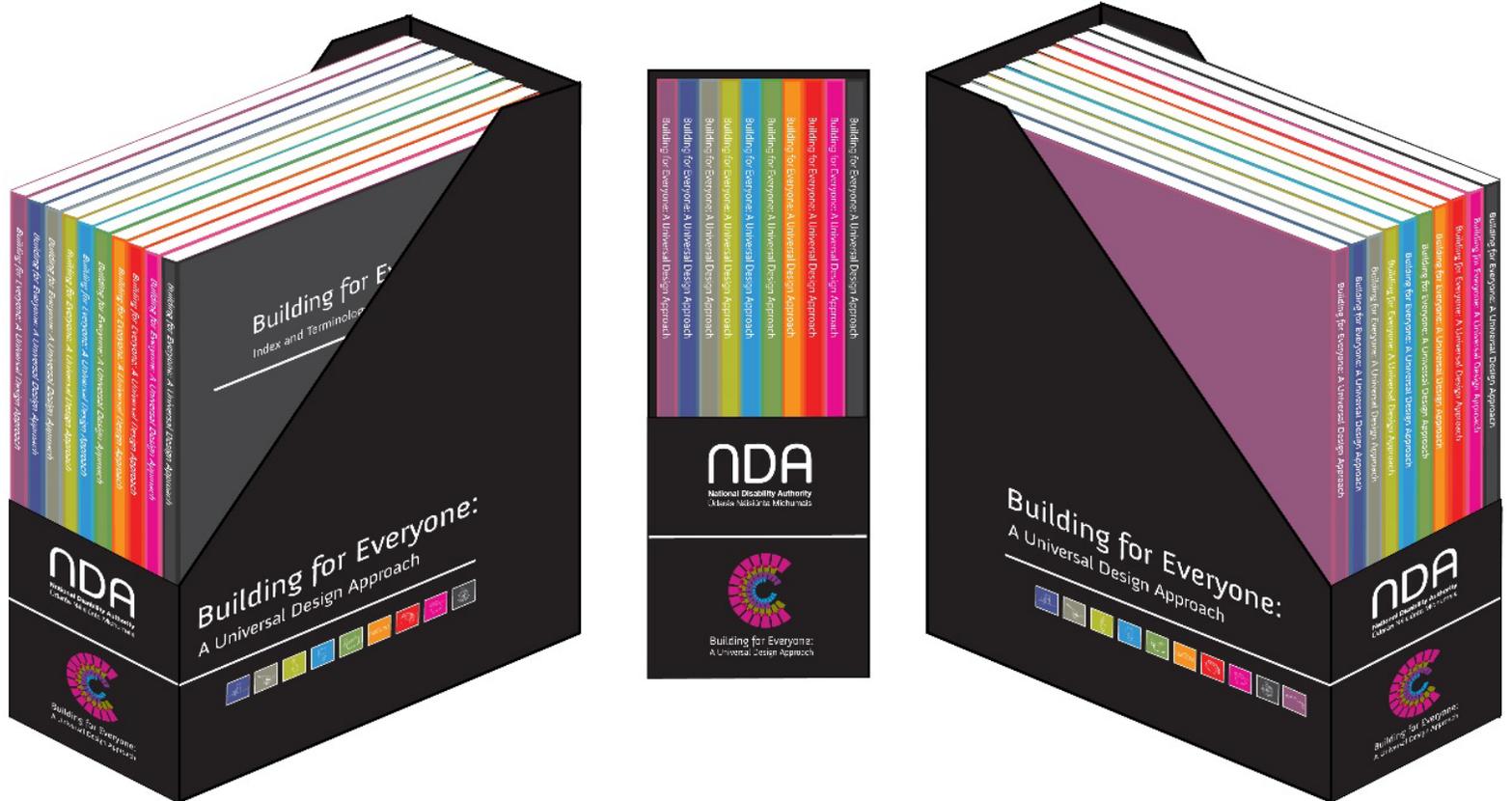


# Design for All

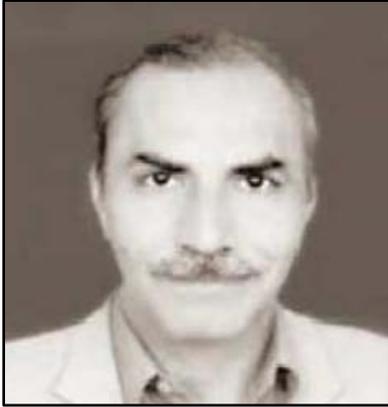


*Guest Editor: Prof Jim Harrison Cork Centre for Architectural Education, Ireland*

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## Letter from the Chairman's Desk

**By Sunil Bhatia PhD**

Few days back there was news that scientists have solved the mystery of bursting signal by finding a unknown planet that exist beyond our known galaxy. I was surprised about mystery of bursting signals that was responsible for knowledge of other planets and its location that helped in discovering it. A beauty is lying in burst that it is loud and sometime its intensity scare with its presence but sometime it silently helps in progress of humanity. Sometime bursting phenomena supported in design of various products and wherever it has inbuilt character of producing adverse effects and controlling needs attention in those cases it proved reason of design of many products for benefiting human's lives.

As I brood more on this simple phenomenon I realize this is not new for mankind but its presence is everywhere from the day we born. I clearly recalled my childhood where I was filling air in mouth and a sudden soft hit by my both hands on cheeks produced bursting sound and I believe that was my first toy for fun. Later I realized bursting sound of balloon was scary and I used to cry but as I get mature the same turned to be a fun. Extension of this act is the design of our horns that blow and produces busting sound for alerting others. Every human does the same and do not dare to act in presence of others because we are trained under social discipline

to avoid embarrassment but a newly born child normally releases digestive unwanted gases with bursting sound in natural way and it does not embarrass anyone and it relieves the baby from gastric pains. It is natural in animal kingdom of releasing digestive gases with bursting sound as well as in men with excretion. A child out of fun makes the bursting loud sound close to the other ears to scare. Sneezing is another natural action that is based on burst. Nature rejuvenates when sowed seeds burst for lease of new life for allowing plant to come out. A gas or water comes out as geyser with bursting sound. Fountains works on basic principle of burst. Fire workers can bring fire inferno under control because of throwing bursting water for extinguish. Design of fire extinguishers is solely on bursting for mixing the chemicals and allowing the gas to come out in bursting manner.

I am fond of cooking and noticed when I threw spices in heated oil there is crackling sound and spices are burst and sometime it was so strong it comes out of the open vessel and there is chance it might burn my skin. Popcorn crackles and bust when it is heated .My vehicle tyre faces challenges of bust of tube because of piercing of sharp elements and to avoid bursting they designed tubeless tyre. Bursting is around us but we hear its loud sound and ignore its silent role in our lives. We have designed various musical instruments where bursting air is controlled for producing desired sound like in flute, saxophone and many others.

Pressure cooker whistle because of steam pressure and its functioning is possible for allowing the stream to burst from the allowed passage. Regulators and valves for water or gas supply are designed for controlling the bursting flow for achieving desired

objectives. Surge in electricity is one kind of burst and to control the damage of devices we have designed stabilizers. Burst noise is present in semiconductor. Inkjet printer works with the principle of bursting where ink is thrown with pressure and it bursts and not leave sharp circle spot as collide with paper. This is the reason quality of output is not sharp as we find in laser printer. Burst buffer enhances and accelerates the performances of input as well out put in computer. Burst is a term used in a number of information technology contexts to mean a specific amount of data sent or received in one intermittent operation. A patient suffering with mild blockage in vein it is cleared by using bursting sudden pressure close to blockage by ballooning. Even scientists are worried about side effects of the medicines and are more relying on new technology of nano where medicines burst exactly at those cells which are with diseases for curing for minimizing side effects. Before this nano technology medicines are coated in such way it should allow medicines to go down deep in stomach and burst of cover releases actual medicines for cure so it can produce minimum side effects. Laser beam burst for surgery where minimum insertion that allow the patient to recover fast compared to knife open surgery. Continuous ignition in automobiles engines chamber burns the oil with high intensity bursting sound. Later to control the repetitive loud bursting sound of automobiles designed various silencers. Aerosol techniques is used in room fresheners or perfumes or where pressing the knob it releases bursting gas mix with perfume and covers wider areas and spread fast in environment compared to without aerosol . Air cleaner for automobiles or for industrial machines are releasing the air with burst in continuous nature to clear the dust. Various types of Air Knife works on burst of

air focuses primarily on the application of removing surface water and other liquids from a variety of products, but they can also be applied to products and processes that involve delicate film control; neutralisation of static charges and/or surface cooling. Air curtain throws bursting air to protect enter the insects. Vacuum cleaners are based on reverse of bursting that sucks the air with sudden force and it is responsible for sucking dust.

Iron smith uses leather airbag to pressure for releasing bursting air for attaining high heat of fire for meeting his objectives. Years ago it was common for a blacksmith to use their lungs to blow bursting air into a hollow tube, directly into the base of the fire. The classical medieval bellows was a device made from wood and leather and was used to push bursting air into the fire to allow the furnace to reach a high enough temperature to make iron melt. Later hand cranked fan to electric motor for bursting air for furnace. Air-bursting grenade in rifle is one of the techniques for hitting the target.

We use the bursting for safety as we did in pressure cooker by releasing safety over pressure regulator and as well as steam vent valve. Rupture disc is also called burst for maintaining pressure. We also use the safety pins for controlling the unwanted pressure of bursting by releasing as it crosses the bearing limit of the pins. Blood pressure measuring instruments is based on bursting of air . Types of pressure-relief device designs include fusible plugs, rupture disks and designed to function by the bursting of a pressure containing. Cycle air pump is releasing burst of air for tube of cycle. Rocket or jet propulsion is solely based on bursting and creates thrust for forward movements. Vehicle passengers and driver safety is designed through air safety bag filled with sudden bursting air to

lessen the damaging impact on assets. Even hydraulic brakes are designed that were better and improved from earlier traditional brakes for retardation.

Burst has given us new thought for preventing not to happen and we learnt the art of filling air in balloon even designed various carry bags of different materials for allowing and loading different weights. Fluid has pressure when it flows and entire pipe technology is based on burst not to happen and even our water supply uses various size and strength of pipes and couplings for supply otherwise it bursts.

In primitive times people used sudden burst noisy sound for instilling the fear in animal for dumbstruck and turn into prey. Other side primitive person also tried to kill by without making their presence known to animals for not to alert for escape and they burst to attack for kill the animal for food. This characteristic is also visible in animal's kingdom. They found that generally minor cut in non crucial place in body was not reason of death but major burst out of blood from large cut anywhere in body . This technique led to design various knives, sword and daggers for killing. Discovery of fire added new thought in their minds and in early time they realized tinder could catch fire fast but to sustaining the life of fire they used thick logs over it. That fire made them to design better sharp tools for hitting for instant death by bursting the blood from opponent bodies. Spitting is based on bursting for throwing cough or saliva and that helped in designing bow for hitting the sharp edged arrow or slingshots for physical pain by hitting the stone or in modern time by triggering the spring loaded rifle of pistol by bursting the bullets . Burst made in firearms for predetermined number of rounds. Reverse of burst is sucking and they used this with mouth for

minimizing the poison effects of venomous animals that attack the humans for self defense might prove reason of death and trained people knew the art of sucking to take out the poison from the victim's body spit out before he comes under its adverse effects.

Use of dip pen as writing instrument was in practice where pen uses external ink for writing. This practice still use in painting. Biggest revolution has come in writing when Waterman designed the instrument with using fluid ink filled internally in tube and biggest challenge for him was bursting of flow of ink. He designed for controlling the burst with capillary tube and metallic nib in such manner it was allowing the ink to that much that was required for writing the words.

Poly urethane foams are designed with tiny air packets that releases bursting air to meet the challenge of weight of sitting person and come back to original shape as he gets up. It is one kind of replacement of metallic spring but use of bursting has given as new techniques of foams. Running shoes are required a cushion for absorbing the impact of fast and heavy foot fall and that does not make easily tired. They designed the sole with air packets that releases when running person shoe strikes the surface and comes back as it again comes in air helps in less tired.

Bursting of the anger relieves the person from mental pain and it is one of the tools to allow the person to come back to behave normal.

*Jim Harrison is a Lecturer at the Cork Centre for Architectural Education in Ireland, and has long experience of teaching, research and publication on aspects of Universal Design and user-friendly*

*Cork Centre for Architectural Education, Ireland*

*design for ageing as well as in integrating these topics into the architectural curriculum. He also has been a supervisor to PhD and Master's thesis of candidates in related topics.*

*Enjoy reading*

*With regards*

*Dr. Sunil Bhatia*

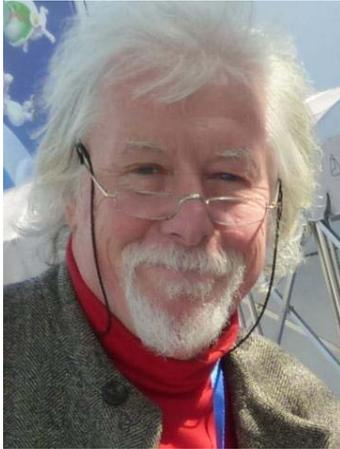
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**Guest Editor:**



*Jim Harrison is a Lecturer at the Cork Centre for Architectural Education in Ireland, and has long experience of teaching, research and publication on aspects of Universal Design and user-friendly design for ageing as well as in integrating these topics into the architectural curriculum. He also has been a supervisor to PhD and Masters thesis candidates in related topics.*

*He has produced numerous publications on inclusive design related topics with over 50 papers and journal articles, a collection of which were successfully presented for his Higher Doctorate (LittD) at the University of Sheffield. Whilst teaching in Singapore (1984 – 2002) he became involved in UN ESCAP 'Training the trainers' accessibility workshops in the Asian Pacific Region, in which he is still active. Amongst many other achievements he contributed a section for the Singapore Access Code on the needs of older people and, as a UN Expert Resource Person, continues to participate in projects on Universal Design promotion.*

## **EDITORIAL:**

### **Carrots and Sticks: Making Universal Design Happen in Ireland**

This month's contribution comes to you from the Cork Centre for Architectural Education, situated in Ireland's second city. This school of architecture, which recently celebrated its tenth anniversary, is a joint venture between UCC (University College Cork) and (CIT) Cork Institute of Technology and both Guest Editors, Jim Harrison and Kevin Busby, teach studio design in both institutions.

CCAIE is a relatively small-scale school of architecture, with a full time staff of only 10 but a larger complement of part-time tutors who, as practicing architects, connect to the real world of design. However, unlike our neighbours in UK schools, where most full time staff would mainly be researching actively in their specialist areas with fewer teaching commitments, teaching staff in CCAIE and CIT have full workloads of teaching as well as advancing their studies through higher degrees and research. Whilst this may appear to be a problem, it does have one real advantage; communication between teachers and students is closer, particularly through the way in which design studio projects may be devised to allow students to engage with aspects of their tutor's research work. In this edition of "Design for All" we have two examples of how this is working; in Aoife Hayes' article she explains how she is investigating her Masters Thesis work "Integrating Sensory and Emotional Intelligence in Architectural Design Education in Ireland." through trialling this in teaching in Second Year of the Interior Architecture course at CIT. Meanwhile in CCAIE, Kevin Busby's PhD work has

allowed him to develop a brief with his colleagues for his Year two studio that allows the students to come up with innovative solutions for multi-generational housing based on Universal Design principles.



### **Example of year 2 housing projects**

His own article in this edition (*Isolation in suburban Ireland*) exemplifies the currency of his research area, to the extent that Cork County Council have shown their faith in the value of a student project relating to Age-friendly design through awarding prizes for the two most innovative designs. These awards also have particular relevance, one being a paid Internship in the Architects Department and the other a Travelling Scholarship to investigate housing for ageing generations in other European countries.

It is now some 30 months since we were last invited to be guest editors, in which time we have seen some initiatives towards the advancement of UD in the education of the upcoming generation of architects and designers. This progress comes about both in-house

and through Ireland's commitment to achieving user-friendly environments, most particularly through the existence and work of the Centre for Excellence in Universal Design (CEUD) which, under the auspices of the National Disability Authority (NDA) is unique in being the only such centre worldwide that is an active government organ.

We are fortunate, therefore, to have an article by Neil Murphy in this edition. As an Architect, Neil plays a significant role in realizing many CEUD initiatives on the built environment side, including a number of very useful publications (which you may download). The scope of these bears witness to the good work the Centre is doing, even though Ireland has experienced significant economic problems in the last few years, from which it is only just recovering. Fortunately CEUD was set up during the boom years preceding the crisis and has survived the lean times and continues to produce some very useful and informative documents.

In addition to publications, events to promote Universal Design are regularly held, such as the Universal Design in Education Conference, held in Dublin Castle in November 2015, to which we the editors were invited to contribute. The workshops were separate sessions, one for ICT and one for the built environment and it is perhaps important to distinguish between the two; whilst ICT and product design are more immediate and can be personalized to the user, they also have a shorter lifespan than the built environment which, because it is more longer lasting and less easy and far more expensive to amend, must be designed properly the first time. For this reason we are reminded of the UD principle of "The design of products and environments to be usable by all people, to the

greatest extent possible, without the need for adaptation or specialized design”

At a Skills-based workshop on Teaching Methods in Architecture entitled *“Weaving Universal Design into Architecture education: methods and practices.”* A presentation was given by Jim, Kevin and our Occupational Therapist colleague Linda Horgan from UCC who contributed to the article and participated in the discussion arising from it. This has been abridged and included in this edition and may inform readers of the way in which CCAE integrates the acquisition of skills and knowledge based on Universal Design principles at different levels of the curriculum and postgraduate stages.

We feel there is an importance to ‘infusing’ UD principles into the curriculum at appropriate points through design projects, rather than as a distinct module. Almost all schools of architecture in UK and Ireland have been obliged to fragment their perfectly-adequate design teaching curricula into modules, both lecture and project based, mainly for administrative convenience to allow students to select flexible courses; this has often led to a lack of the integration which is so vital to developing design skills in students. Although suggestions to create identifiable modules on universal design in the built environment have been proposed, these have never been taken up – partly because most curricula already have more than enough topics to cope with, but more particularly that tutors feel that this aspect of design will be more easily understood and tried when integrated into building design programmes in studio at a variety of levels. This would then be backed up in technology sessions which cover related aspects, including application of building codes, experiential exercises where students gain some insights into the

problems of using everyday spaces when using wheelchairs, crutches or blindfolds.

Other incentives promoted by CEUD include an annual Universal Design Grand Challenge, aimed at specific sectors of the design community, including students. Three years ago one of our year 2 students Christopher Fitzgerald was a worthy runner up with his scheme for a passive entry door system.

One of the most apparent problems resulting from the economic downturn is the continuing housing crisis. There is a danger of hastily building housing stock without regard to the need for design that is sustainable in human terms as well as economic ones over a prolonged period. Such a move may seem positive in the short term but a lack foresight amongst providers, both in private sector developers and at local government level and a lack of real understanding about the design of dwellings and communities may actually make them inappropriate for an ageing population. Although there has been much discussion there appears to be no real strategy, leading to fears that short-term solutions will lack design integration of acceptable lifetime standards; excuses of economy on space and lack of funding for proper specification being cited as reasons. There may also be a knowledge gap in some sectors of the profession and agencies that are responsible for providing the requisite housing stock, so this is clearly an opportunity for education through Continuing Professional Development. Apart from initiatives by CEUD, Ireland also has one professional practice dedicated to Universal Design in the built environment; O'Herlihy Consultancy (<http://www.accessconsultancy.ie/>) hold regular workshops on related current issues for professional and technical designers, as well as professional advice.

**'The Age-Friendly City' is an international initiative and, as a signatory to this, Ireland has a commitment to preparing a strategy for the future, including housing for ageing populations, translating the concept of the age-friendly city into Lifetime Neighbourhoods and Lifetime Homes, these last two being key concepts. County authorities have been tasked with looking into how they might respond and in this respect County Cork has made some positive moves, including a liaison with the school of architecture, where there is a lively and ongoing interest in this area, at design studio and research level. Co-editor Kevin Busby is currently investigating this field for his PhD, and Jim Harrison is his supervisor on this, being the topic of the article in this edition:**

**In addition to teaching in design studios the authors are also involved in various forms of consultancy work. The school has an informal liaison with Irish Guide Dogs for the Blind association, a charitable trust that not only trains and provides guide dogs for people, but also advises on such matters as school adaptations to accommodate students with visual impairment. Pupils may be placed in school where the premises need to be modified for their safety, accessibility and convenience, and Kevin and Jim are able to advise specialists in the needs of vision-impaired people on how a building may be effectively adapted**



Consultancy at CCAE is, however, not confined to Ireland. Based on a long standing contact with South East Asia, editor Jim Harrison continues to act as a United Nations Expert, advising on the propagation of Universal Design in the built environment in the UN ESCAP (Economic and Social Commission for Asia Pacific) region. In December 2014 he was invited to ESCAP "South-South Cooperation Programme on Accessibility for Persons with Disabilities" which was held in Guangzhou, Macao and Hong Kong, China. Here 68 participants from 11 countries attended, plus ESCAP associate members who were partners with the Government of China/China Disabled Persons' Federation and 4 Observers from Korea. Participants included architects, engineers and planners, as well as government executives whose responsibilities would encompass the design of buildings and public facilities and spaces.

The slogan of this lively series of workshops and technical visits was "Make the Right Real", underscoring the intention of the Biwako Millennium Agreement and the "Incheon strategy" that followed this (2013) to implement the rights of people with disability. Goal 3 of the Incheon Strategy, which is the World's first set of regionally-agreed disability-inclusive development goals that are time-bound and measurement orientated, focuses on accessibility in the built environment.

The Biwako Millennium Agreement concludes, "The concept of Universal / Inclusive Design has emerged as a result of the struggle of persons with disabilities for accessible physical environments".

The programme included technical presentations and practical sessions, focusing particularly on ways in which environments can be effectively audited for the inclusive qualities, which is more

complex an issue than merely ticking boxes on individual barrier-free elements. Varied field visits to sites in each of the three cities were particularly informative, demonstrating the efforts made by different authorities. What was interesting, from an expert point of view, was how the building codes of each city differed in their approach; Guangzhou's buildings exhibited standards and techniques which contrasted with those of Macao, once a Portuguese colony and with a more European approach. Hong Kong's British legacy showed in the way things were done there. The impact of regulations on the built environment – the 'stick' to encourage compliance, was very apparent; but so too was the enthusiasm and ingenuity of local groups and city departments to improve standards, which is the 'carrot' to encourage design for a better world for everyone.



*Jim Harrison*



***Aoife Hayes is a postgraduate research and part-time tutor at Cork Institute of Technology, Ireland. Previously completing a BSc. Interior Architecture (hons) in 2012, she has gone on to research the sensory and emotional effects of the built environment, and how this affects the user. The research is aimed at developing and validating an educational resource pack, to integrate sensory and emotional awareness into architectural design education.***

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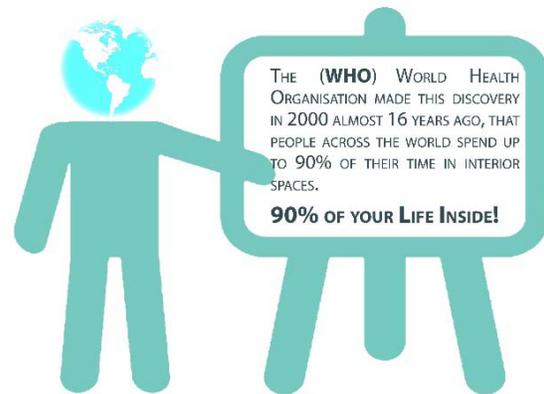
# **Concept Thresholds for the introduction of Sensory and Emotional Intelligence into Architectural Design Education**

*Aoife Hayes*

## **Introduction:**

The 21<sup>st</sup> century, as a whole, has seen massive developments in smart technologies, environmental strategies and architectural form.

The 3D built environment is advancing on a daily basis, but has become a very two dimensional experience, frontloaded with screened imagery and visual stimuli, which has encouraged a trend of *ocularcentric*



*Figure 1 Education Graphic (Author, 2016)*

dominance. Pallasmaa suggests

the over-intellectualisation of architecture has a part to play in this disconnect, detaching it 'from its experiential, embodied and emotive ground'(Pallasmaa, 2007). Unfortunately, as a result of this, the human experience is very often lost. This identity crisis, whereby architecture is borderline art, may be associated with the rapid advancement of visual representation techniques in architectural design. The prioritisation of the multi sensorial human experience is not only at threat from this visual predominance, but also environmental concerns' and economy seem to hold a greater place on the hierarchy. Research carried out by the WHO established that the vast majority of people, spend up to 90% of their time in indoor

spaces(WHO, 1999), and yet this does not reflect the positioning of the human experience within the design process. By continuing to rely on one sensory modality, our built environment is increasingly failing to respond to the sensory and emotional needs of the user. Architectural design must remember it has a responsibility to enhance the human experience, not dismiss it.

### **Developing an educational tool:**

Developing a level of awareness among the architectural design community is essential in order to prioritise the human experience throughout the design process. Although there is no immediate solution, education can play a key role in addressing this issue. If the education system begins to supply industry with graduates who hold an awareness and knowledge for the multi-sensorial human experience, this in turn, will encourage a more human-centred approach in industry which promises huge individual and societal benefits.

The authors' primary aim is to develop third level educational content, which deconstructs the human experience in the built environment, in terms of the sensory stimuli and emotional intelligence. The content allows both, the lecturer and student, to understand how people perceive, experience and develop relationships with, their environments. This newfound understanding and knowledge of the human experience, should allow the designer to control and manage, the balance of sensory stimuli and emotional response, in their 3D designs.

In order to deconstruct sensory stimuli and emotional intelligence, an interdisciplinary approach needs to be adopted, drawing from areas such as environmental psychology and neuroscience to allow for their pre-established principles, models and research, to assist the understanding of the holistic human experience. Quiet often the channels of



communication within various disciplines are

*Figure 2 Educational Graphic 'What topics to expect', (Author, 2016)*

closed loop. Fisher suggests the inaccessibility of environmental psychology is an issue which needs to be addressed immediately in order to bridge the gap between architectural design and environmental psychology discoveries (Fisher, 2004). The language barrier, rooted in discipline specific terminology, may also prevent neighbouring disciplines utilising readily available valid research. Consequently, integrating interdisciplinary terminology into the architectural educational spectrum is a pivotal part of the content design and must be portrayed in a non-intimidating and legible manner, whereby it is accessible for all.

### **Testing and validating the concept thresholds:**

Testing the proposed content is an essential part of the research, and so a live test bed has been established to carry out an educational trial at Cork Institute of Technology, within the architecture department. This department which links up with CCAE (Cork Centre of Architectural Education) hosts a variety of

architectural design courses, but given the volume of time people spend indoors, the *BSc. Interior Architecture* course presented itself as a very relevant sample for the educational trial.

The next stage to be considered is; what content needs to be incorporated, and how best to integrate it into to design studio module? The research has established certain topics which are key fundamentals that the learner must understand, in order to achieve sensory awareness and implement sensory and emotional sensitivity in terms of the human experience into their designs. The following highlights the key concept thresholds which will feature in the educational resource pack.

### 1. The Aristotelian Senses in the 21<sup>st</sup> Century:

The content must seek to, introduce the student to the Aristotelian basic human senses(Sorabji, 1971) and place them in an architectural context. For

example, by discussing the sense 'touch', the student can identify how touch is relevant in architectural design in terms of, appreciation of 3D form, materiality, texture and temperature. At this point the student has identified (haptic)

sensory architectural context, which ensues sensory

relevance and necessity. The other senses, sight, smell, hearing and taste, would all be introduced in the same manner and further deconstructed into their 21<sup>st</sup> century expanded format. The key

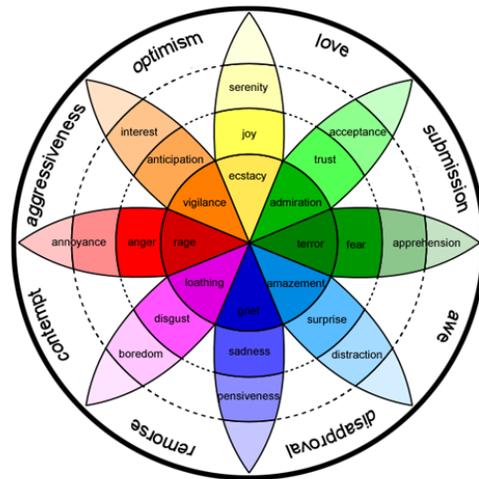


Figure 3 Robert Plutchik's 'Wheel of Emotions' (Plutchik, 1980)

learning threshold that must be achieved, is an awareness of the human senses and the sensory process which occurs each and every time a sense is stimulated. By understanding this process the learner can begin to appreciate the undeniable relationship between the sensory system and emotional registration in the brain. The neurological aspect may seem daunting to any learner and therefore architectural context is pivotal to ensure a deep level of understanding and relevance is achieved, to allow future application.

## **2. Emotional Registration through Sensory Processing:**

Establishing the link between the sensory processing experience and the emotional implication is essential to emphasise the actual lived human experience – the body receives a sensory message and processes an emotional response. Robert Plutchik's *'Wheel of Emotions'* is used to introduce the students to *'emotional'* vocabulary and the varying intensities of emotional response that are typically felt. At this stage, the student should be aware that each sensory experience has an emotional impact on the user affecting their experience of a space, place or environment.

To root this learning in architectural design context, the students are challenged to firstly explore their homes, a familiar space, in terms of their sensory and emotional experience. Figure 4, displays a template used to guide the students, which prompts them to identify a space within the home, the predominant sense they associate with that space and the emotion (registered) felt as a result of the sensory stimuli experienced.

The responses from the individual students varied, but largely represented an emotional response to how the space is occupied as opposed to the actual space e.g. the smell of cooking in the kitchen triggered

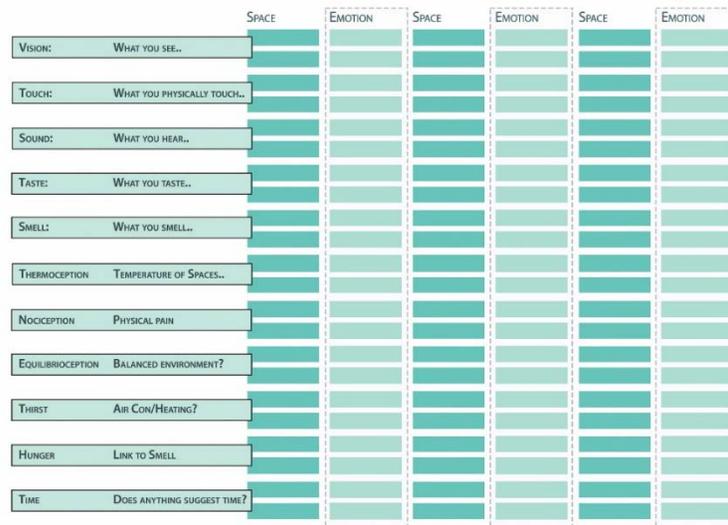


Figure 4 Educational template 'Sensory & Emotional Mapping', (Author, 2016)

comfort and nostalgia as opposed to the visual aesthetic of the kitchen itself. This is a pivotal moment for the student, in that, most of the students let visual aesthetic dominate their design process and consider it to be the more significant aspect of a design scheme, yet, they have all reported emotional descriptions of their homes and not visual aesthetic descriptions. The students have come to realise, that they experience space, place and environment in an emotional way yet they do not design space, place or environment with an emotional design process. Is this a cognitive dissonance fuelled by media portrayals of 'good design' based on photographic promise, or maybe awarding bodies who offer validation for 'good design' based on 'novel' or 'innovative' schemes and not the lived experience. When educating young designers it is vital to remember that the media has huge persuasive capabilities that promote a visual appreciation of the world, as opposed to the multi-sensory appreciation. (Kaplan and Kaplan, 2009) This disconnect must be highlighted and discussed to develop the students criticalability.

### 3. Realisation of Primitive Need

How people perceive, understand and relate to the built environment is vital when catering for the human experience but must be further supported with an understanding of what people need and why? What *'Primitive Need'* do people have of a given space, place or environment, and does architectural design play a role in providing this need?

Figure 5, shows some of the abbreviated responses given by the students when asked to

identify their understanding of a *'Primitive Need'*? Although some hold a very *'21<sup>st</sup> century approach'* toward what can be classed as a human *'need'*, they can however, be considered very important factors in current daily life. This

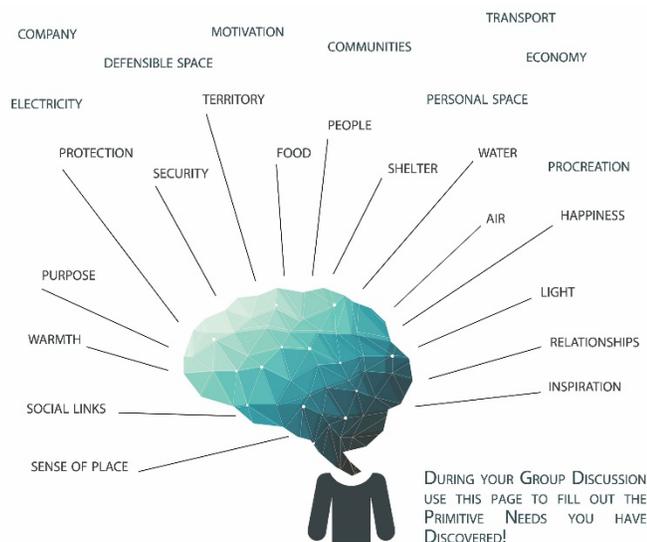


Figure 5 Educational Graphic "Primitive Need Template" (Author, 2016)

group discussion repositioned the importance of architectural design in society, and highlighted how many of the basic human needs are affected by the design community e.g. shelter, air, light, warmth, hygiene etc. The students also began to associate that not all human needs are physiological, that a significant amount of human need can be quiet psychological e.g. purpose, territory, personal space, sense of place, security, which harbour huge daily emotional implications on human experience in space. It is

important to realise that the physiological and the psychological are inextricably linked, one will always effect the other.

The three stages identified to date; *Human Senses*, *Human Emotions* and *Primitive Need*, encourage the students to design holding a user-centred approach. They start with the potential user and address the sensory, emotional and primitive need of that demographic, working outward toward the skin of the building. This approach forces the space to meet the needs of the user and not the user to adjust to a predefined space. This exercise encourages a shift in mentality which repositions the human experience in the hierarchy of the design process. To aid this transition the students are introduced to new theories of design process e.g. "Imposing an Idea" or "Person at the Centre" and "Circle of Space" (Unwin, 2012) which promote a user centred approach. They are encouraged to try these methods to allow the space adjust to the user needs, and not the user adjust to the space. Symbiotically, the students are also introduced to the idea of '*proxemics*' to inform how they allocate personal space in various places (Hall, 1992). Through this process they develop an appreciation for emotionally comfortable spaces not just ergonomically comfortable spaces. Everything designed is to be used by people, so therefore should the design process not begin with the person and their primitive, physiological and psychological need?

#### **4. Human Connection with Space, Place or Environment (SPE)**

In order to design spaces which consider the human experience, the student must be able to identify why relationships are formed

with certain spaces, places or environments. "Virtually everything that man is and does is associated with space. Man's sense of space is a synthesis of many sensory inputs: visual, auditory, kinesthetic, olfactory, and thermal"



Figure 6 Educational Graphic, 'Primitive Need', (Author, 2016)

topic largely delves into

the area of environmental psychology, exploring topics such as 'place attachment theory', 'familiarity' and 'informational needs'.

Once again, through group discussion and peer learning, the students are prompted to explore the question "Why do we feel certain emotions in certain Spaces or Places?"

The simplest way to engage students with this question is to ask why? Why do they return to specific spaces? Why

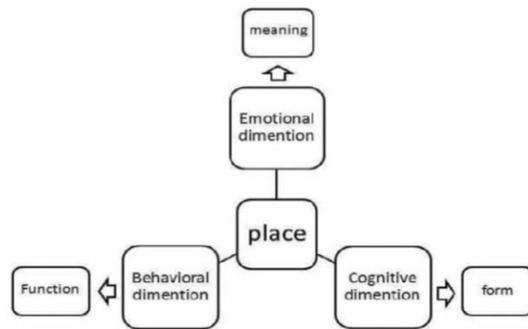


Figure 7 "Dimensions of Creating Places" (Hashemnezhadet al., 2013)

do they feel a sense of place or attachment? The main reasons offered by the group were familiarity, comfort, social links, olfactory stimuli, sight lines, identifiable spaces and memory. Again, the responses provided by the students prove to be quiet emotional and centre on the user experience and how a space is occupied, with little mention of the visual aesthetic.

So what are the key elements to consider when designing a good space in terms of the human experience? An environmental psychology approach offered by “Jorgensen (2001) and Canter (1977b)” suggest that people consider three dimensional elements when creating place; “*form, function and meaning*” (Hashemnezhad et al., 2013). *Form* and *function* are two very common words dished about in the architectural world, but are they considered in terms of how they affect human behaviour? In this instance ‘*the creating elements of a place*’, *form, function and meaning* correspond to *cognitive, behavioural and emotional* dimension.

- **Cognition linked with Form**, addresses the informational needs of the user, which allow them to understand, navigate and perceive the geometry of a place in a reasonable manner. Kaplan (1995) suggests, humans are information-based organisms, “[w]e yearn for it, we hoard it, we are overwhelmed by it” (Young, 2013) and so, in order to provide environments that promote understanding in a reasonable manner the information needs of people must be acknowledged. The RPM (reasonable person model) suggests “People are more reasonable, cooperative, helpful, and satisfied when the environment supports their basic informational needs.” (Kaplan and Kaplan, 2003) The user should be able to navigate and orientate themselves in any given space, and not feel alarmed by the physical presence of the space.

- **Behavioural linked with Function**, addresses the ability of the space to meet the functional or practical needs of the user. The type of environment designers place people in can either support or hinder behaviour, these choices can effect everything from “behavioural competence to psychological wellbeing”(Young, 2013). Our spaces, places and environments should support *‘reasonable behaviour’*. The functional or physiological needs of the user must be met to allow them excel in their role within a space, place or environment.

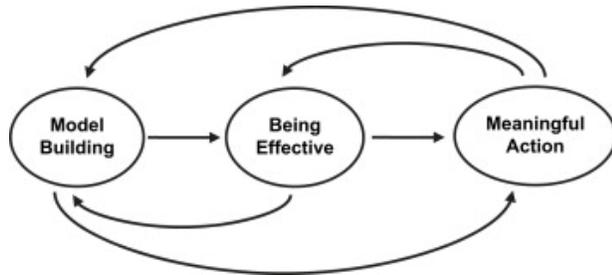


Figure 8 The Reasonable Person Model (Kaplan & Kaplan, 2009)

- **Finally, Emotional linked with Meaning**, addresses the overall satisfaction of the user experience in the space. “Bringing out the best in people is more likely when the environment supports understanding and exploration, develops competence, promotes a clear head and enables meaningful action”(Young, 2013). Designers must consider how the end human experience will affect contentment within the space, place or environment. A sense of *‘place attachment’* can only be achieved if the human experience is considered in context (Hashemnezhad et al., 2013).

These areas link the physiological environment with the psychological environment, suggesting that one must influence the other and must be considered together throughout the design process. The

*'dimensions of creating place'* model can aid the designer in acknowledging the human experience in terms of psychological impact. The links presented allow the designer to consider psychological impact in a language they understand and identify with e.g. Cognition linked to Form. Furthermore, by breaking down the physiological and



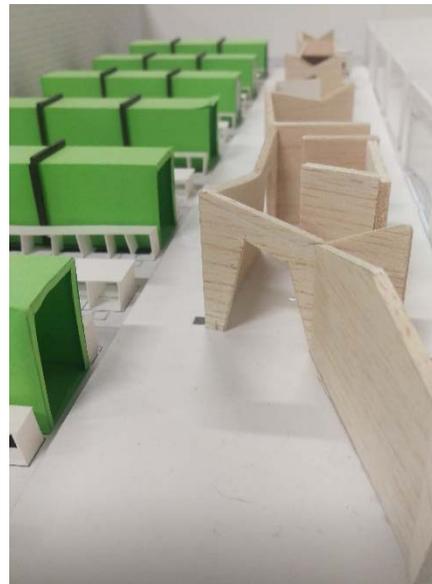
*Figure 9 Student Boulevard Project (Author, 2016)*

psychological factors in localised terminology, such as “the physicality of a place; size, scale, components, diversity, texture, decoration, colour, odour, noise, temperature,” and (psychological) “emotional factors such as identity, history, fun, mysterious, pleasant, wonderful, security, vitality and memory”(Steele, 1981)allows the designer to understand how people may communicate with a space and so, are better equipped to control and manage this relationship.

The students explore this theory by analysing a recently submitted design studio project, ‘Creating a social space within

an open plan educational facility'. This project gave the students a long rectangular space, within an open plan architectural educational facility. They had to then create a social space which reflected the demographic housed within in that space.

*Reflection* in design education is essential (Schön, 1987, Boud et al., 1985), therefore, analysing their individual design schemes in terms of how *Form, Function* and *Meaning* are affected by *Cognition, Behavioural* and *Emotional* dimension allowed them to reach a deeper level of understanding of the lived experience with their schemes. They critiqued their proposal for information needs, and potential emotional comfort within in the space. Approaching the scheme from a virtual tour perspective, they navigated their 3D models as if they were a person transitioning through the scheme and identified potential oversights and unintentional adverse effects on human experience. A number of students identified issues with the sightlines in their schemes, in hindsight they felt they would not provide adequate '*informational need*' for the user to navigate the space with ease. One student reported the lack of social space and expanse areas may not promote *emotional comfort* or *attachment* to the space due to a lack of intimacy. The majority felt



while they had created a *Figure 10 Student Boulevard Project (Author, 2016)*

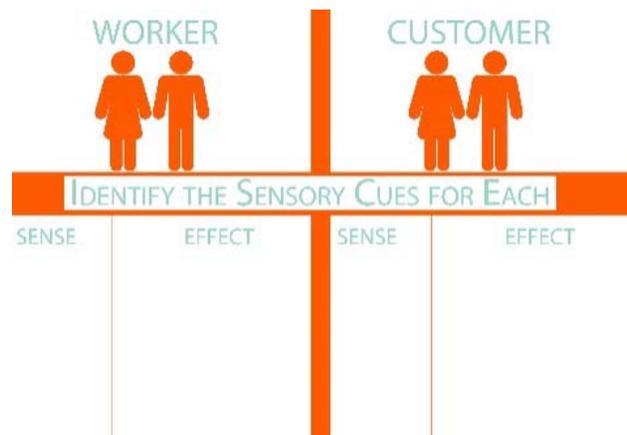
potentially social space, they had not considered the lived functionality of the space. The spaces they had designed did not consider the *sensory output* from the social space which may impede learning in the open plan classrooms. They had not considered visual stimuli, noise pollution, and general activity within the social space in terms of sensory output. The functional aspects were not considered in context which in terms may promote poor behaviour among the occupants of the space and the neighbouring educational environment. Hence, a realisation occurred, that although their schemes appeared finished physically and aesthetically, they were lacking in many other dimensions.

#### **5. Identifying Sensory Cues and Profiling the User.**

Controlling sensory stimuli exposure (sensory cues) in space, place and environment is another important factor which hugely affects the human experience. Establishing the possible sensory cues which may have impact on a space, place or environment can be a daunting task for a designer given the expansiveness of the area. "Environmental characteristics such as luminosity of light sources, the nature and level of ambient noise and acoustics, the presence of specific odors, color hues and shades, and materials and atmospheric factors such as temperature and humidity, all generate sensory input, and combined contribute to specific reactions in the observer" (Schreuder et al., 2016). In a bid to simplify this process, the research has formulated a three stage process for identifying potential sensory input in any given space, place or environment.

*Cork Centre for Architectural Education, Ireland*

- Location of the space, place or environment.
- Intended Use of the space, place or environment.
- User Profiles of the space, place or environment.



*Figure 11 Limited Object Project, Brief supported by further imagery.*

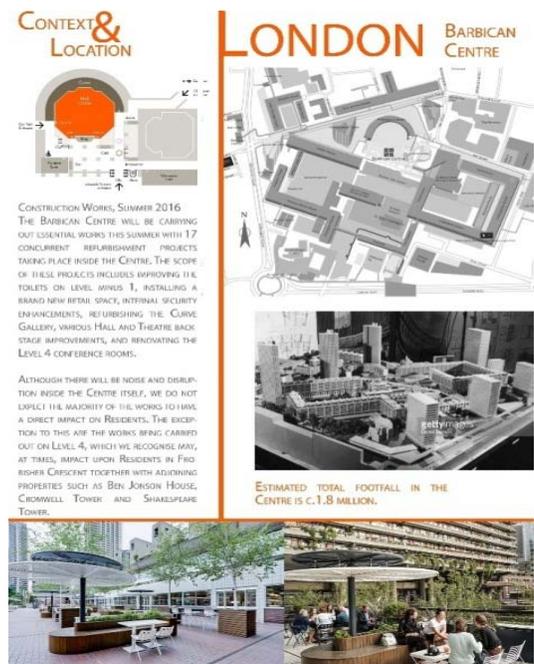
These stages are utilised in

two separate student projects, a local urban café and a high density city restaurant. Both projects revolve on a *limited objective theory* in order to allow

the students to fully concentrate and immerse themselves in the sensory analysis of the provided place. Their task is to identify the possible sensory exposure/cues based on the location of the space, place or environment (SPE), the use of the SPE, and the user profiles that occupy the SPE. The students are operating in

groups to encourage peer learning and a

deeper level of learning, and are given the following information on their locations:



*Figure 12 Limited Object Project, User Profile Template. (Author, 2016)*

- *Descriptive abstract of the SPE, Context map, Plans, Photographs of the space in use, Yearly Footfall and General Density of the space, place or environment.*

The students are also encouraged to break down the *users profile* within the space, place or environment. This is a very important part of the design process which is not very often implemented. In this instance the students operate with two profiles, the worker profile and the customer profile. In order to analyse or manage sensory and emotional impact, the profile must be identified to establish the different needs of each profile. The needs of a worker profile within a restaurant and very different to customer profile, but each are pivotal to the success of the design scheme and lived experience.

The analysis generated by the individual groups is discussed collectively and certain discoveries pose informed arguments and thoughts based on sensory output and exposure. The students pose very valid and informed questions such as "How do you know which sense is more important than the other?" Which profile is more important than the other?"

The key learning here is that the students realise that one sensory cue can affect another in varying ways, and therefore can affect how each user profile is catered for. Answering sensory or needs must always be done in context, user profile context and multi-sensorial context. Schreuder (2016) offers a classification for the various sensory modalities when integrated, which aids the overall understanding of the sensory experience.

**Multiplied**—suggests that there is sensory cooperation when more than one sensory modality are integrated.

**Disambiguated**—suggests that “one cue helps resolve an ambiguity in a second cue”.

**Vetoed**—suggests “a stronger cue is selected over a weaker cue”.

**Inhibited**— suggests that one sense may suppress or have a subdued effect on another.

**Novel Affect** – suggests the stimulation may have Illusive or exaggerated perception or actual reality. E.g. something may seem louder than it is (Schreuder et al., 2016).

While the students do not necessarily need to understand sensory processing to this level, particularly at a fundamental level of learning, it does offer clarity and a more structured approach toward applying sensory understanding into their designs, and promotes a deeper level of learning.

### **Conclusion:**

When *'Designing for all'*, it is suggested that as designers we must cater for people of all ages and all abilities in a ubiquitous manner. Quite often, this can be interpreted in a very visual or physical manner, and so, the extended sensory modalities and emotional or psychological effects are not given the same weight throughout the design process, and as a result the human experience, in most cases, is not fully considered. This may be associated with the western world's concept of the human condition as a whole. Largely “the body and the mind

are understood as unrelated or even conflicting and exclusive entities that do not constitute an integrated unity" (Pallasmaa, 2017), understanding the physiological and the psychological in union is essential for progressive embodied design.

The design community is on a journey to establish universal design standards globally and so, the human embodied experience must be repositioned within the hierarchy. Education offers the largest platform to introduce change, in order to see a long-term shift, in approach among the design community. Education and re-education are essential in combating the adverse effects of cost-cutting and capitalism in the industry, and "what better book is there, than the book of humanity" (Chavez). Designers must first be educated on how to sensitise environments and manage the sensory and emotional user experience, consequently, designers can then educate their clients. There is a myriad of research already available to support this approach which in the end proves more feasible through user productivity and contentment. The below quote taken from *"Architects Behaving Badly"* offers strong argument for a user centred approach to design.

*"Contrary to the assumption that more unencumbered space increases people's use of parks, research shows that increasing the number of trees does so, especially in and around public housing. Contrary to the assumption that increasing class sizes reduces costs, research shows that crowding too many children together in schools and day care centers increases instructional and behavioral costs. Contrary to the idea that reduced clutter in offices leads to greater efficiency and better morale, the research*

*shows that clutter and the ability to personalize office space improves worker well being and job satisfaction(Fisher, 2004)“.*

As designers, we must make a conscious effort to understand people and how people live in the built environment. The channels of communication must be opened up and research disseminated in a legible manner, to ensure designers of all disciplines, are given every opportunity to create environments which strive toward a universal humanistic society. Informed physiological and psychological design choices can only promote more sustainable, habitable environments and growth in society. Creating third level educational content, which offers an introduction to *‘designing for the human experience through sensory and emotional intelligence’*, can only strengthen the graduate body entering the design industry. Supplying the industry with a sensitised designer, confident to challenge and utilise interdisciplinary research, will push the boundaries of universal humanistic design and further strengthen the design community’s ability to *design for all*. We must remember *“we only see what we look at, and what we look at is an act of choice”*(Berger, 2008), and so, we must consciously broaden our sightlines to envisage and implement a multi-sensorial built environment.

**Keywords:** *Sensory and emotional design, human experience, teaching and learning, architectural education, universal design.*

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***Aoife Hayes***



***Neil Murphy MRIAI***

***Neil Murphy took up the post as Senior Built Environment Advisor at the Centre for Excellence in Universal Design (CEUD) in October of 2008.***

***He is a graduate of Dublin Institute of Technology, Bolton Street & Trinity College Dublin with an honours degree in Architecture. He is also a registered Architect with the Royal Institute of Architects of Ireland (RIAI), MRIAI.***

***Neil has worked on a wide variety of projects in commercial Architecture in various Berlin & Dublin firms as both a Project & Site Architect for 12 years including winning an award for a boardwalk and river front amenity in 2007.***

***Neil was the project manager for the following CEUD design guidance documents; the revision of 'Building for Everyone: A***

*Universal Design Approach', the 'Universal Design Guidelines for Homes in Ireland' and the 'Universal Design Guidelines Dementia Friendly Dwellings for People with Dementia, their Families and Carers', 'Shared Space, Shared Surfaces and Home Zones from a Universal Design Approach for the Urban Environment in Ireland' and 'Research on Universal Design of Shared Educational Campuses Key Research Findings & Recommendations Report'.*

*Neil is also a member of the RIAI's Universal Design Taskforce and is a judge on several professional design organisations annual awards juries.*

## **The Centre for Excellence in Universal Design**

**The Centre for Excellence in Universal Design (CEUD) is dedicated to enabling the design of environments that can be accessed, understood and used regardless of age, size and ability. The CEUD is based in Dublin, Ireland and is part of the National Disability Authority. The Centre is also the only statutory centre for Universal Design (U.D) in the world.**

**The Centre is dedicated to the principle of universal access, enabling people in Ireland to participate in a society that takes account of human difference and to interact with their environment to the best of their ability.**

**The Centre's remit involves three areas; the Built Environment, Information, Communication & Technology (ICT) and Products and Services.**

**As part of this remit - CEUD organises and hosts many workshops, seminars and conferences that cover the three areas listed above. Built environment professionals and stakeholders that represent age, size, ability or disability are invited to these events. We find it is a great learning experience and opportunity to network across many sectors to have mixed attendance at the various events we run.**

**Recent notable events run by the Centre were the following;**

**On Thursday 5th May 2016 Dr Diana Anderson gave a presentation about Evidence-Based Healthcare Design at the Centre for Excellence in Universal Design. Dr Anderson, MD, MArch, is a licensed architect (Order of Architects of Quebec, Member of the Royal Architectural Institute of Canada, LEED AP) and a Physician trained in Internal**

Medicine. As a "dochitect", Dr Anderson combines educational and professional experience in both medicine and architecture in order to truly understand what is involved in medical planning and working within the healthcare environment. Diana was also the jury chair for the CEUD funded Royal Institute of Architects Ireland 2016 Annual Awards Universal Design category.

Dr Anderson's presentation looked at how hospitals and healthcare buildings can be designed from a Universal Design approach in order to:

- *Improve care delivery and patient experience*
- *Prevent clinician burnout*
- *Integrate caregivers and family needs*
- *Foster interdisciplinary collaboration for improved care*
- *Address the changing practice of healthcare*
- *Apply design-thinking to medicine for enhanced efficiency*

In 2015 there was a particular focus on U.D and education. The Centre, in conjunction with the Institute of Technology Blanchardstown, Institute of Technology Tallaght and the Dublin Institute of Technology, as part of the Technological University for Dublin Alliance (TU4Dublin) organised and hosted a two-day conference "Education Across the Continuum: Innovating through Universal Design" The Conference consisted of a series of workshops, keynote speakers, exhibitions and a 24 Hour Universal Design Hackathon. The event showcased the "best in class" teaching practices of Universal Design from Ireland and internationally and

provided educators with practical skills and resources to start teaching Universal Design today.

Universal Design offers the opportunity to create graduates whose attributes will enable them to participate in a global economy and contribute to the social and cultural development of their own communities.

The Centre also had the pleasure of hosting, leading U.D expert, Professor Ed Steinfeld ArchD, AIA, (Director IDEA Centre, Co-Director of RERC on Universal Design & The Built Environment, Co-Director of RERC on Accessible Public Transportation, Professor at Buffalo University & Founding Member of Universal Design in the USA) for the launch of 'Universal Design Guidelines for Homes in Ireland' and 'Universal Design Guidelines Dementia Friendly Dwellings for People living with Dementia, Their Families and Carers'. Professor Steinfeld gave the key note speech at the launch and was also the jury chair for the CEUD funded Royal Institute of Architects Ireland 2015 Annual Awards Universal Design category.

Further information on these events and others can be found at;  
<http://universaldesign.ie/News-events/>

The Centre's work on Universal Design for the Built Environment involves conducting original research and developing design recommendations and guidance for use by built environment professionals on a wide range of building types and spaces, including homes, shared spaces, and educational campuses.

The Centre provides advice to built environment professionals with regards to designing buildings and spaces from a Universal Design approach.

## **Built Environment Research and Design Guidance work**

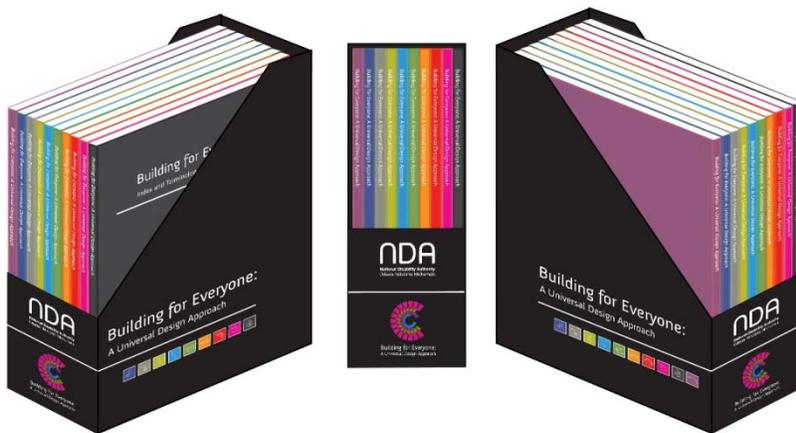
**'Building for Everyone: A Universal Design Approach'** provides comprehensive best practice guidance on how to design, build and manage buildings and spaces so that they can be readily accessed and used by everyone, regardless of their age, size, ability or disability.

The series can be downloaded here;

<http://universaldesign.ie/Built-Environment/Building-for-Everyone/>



# Cork Centre for Architectural Education, Ireland



## **The Universal Design Guidelines for Homes in Ireland**

**Our work on housing includes guidelines and research on Universal Design for Homes in Ireland as well as guidelines for Dementia Friendly Dwellings for People living with Dementia, their Families and Carers.**

**The Guidelines can be downloaded here;**

**<http://universaldesign.ie/Built-Environment/Housing/>**

**These Home Design Guidelines are a first step in the process of raising awareness and inspiring people to think differently about the benefits of Universally Designed homes and the potential opportunity to address some of the global challenges society faces by future-proofing our homes through embracing Universal Design thinking.**

**When home environments are people-centred in design, convenient and a pleasure to use, everyone benefits. Simply put, Universal Design is good design.**

**The Design Guidelines are not intended to be overly prescriptive, but provide a flexible framework for designers to apply the guidelines creatively to all new home types through incremental steps described as UD Homes and UD Homes +. The Home Design Guidelines are informed by research, a literature review of national and international best practice and guidance and a consultation process with key stakeholders. Universal Design Home Design builds upon social and technological advancements in Ireland and internationally. The consultation process with stakeholders that informs these guidelines highlighted a need for better quality housing design for everyone in Ireland for the future.**



Although the guidelines enhance quality of life for everyone in their homes, they would not necessarily meet every need to accommodate an individual's personal factors, circumstance or choice. TheUD Home ++ Guidance and design tips are also provided to raise awareness and assist in person-centred design.

## Home Location and Approach 01



- UD Home Guidance
- UD Home Plus Guidance
- Houses
- Apartments

Universal Design Homes should be appropriate to their context and create a strong sense of place. Attention to detail and high quality materials are essential to ensure longevity of use. Well-designed housing will be appreciated and treated well by the people who live there.

## Entering and Moving Around 02



- UD Home Guidance
- UD Home Plus Guidance
- Houses
- Apartments

Attention to detail, taking into consideration the different sizes and capabilities of people over their lifecycle, can make Universal Design Homes easy and safe to enter and move around for everyone. Good design decisions can allow the home to adapt to changing requirements over time.

## Spaces for Living 03



- UD Home Guidance
- UD Home Plus Guidance
- Houses
- Apartments

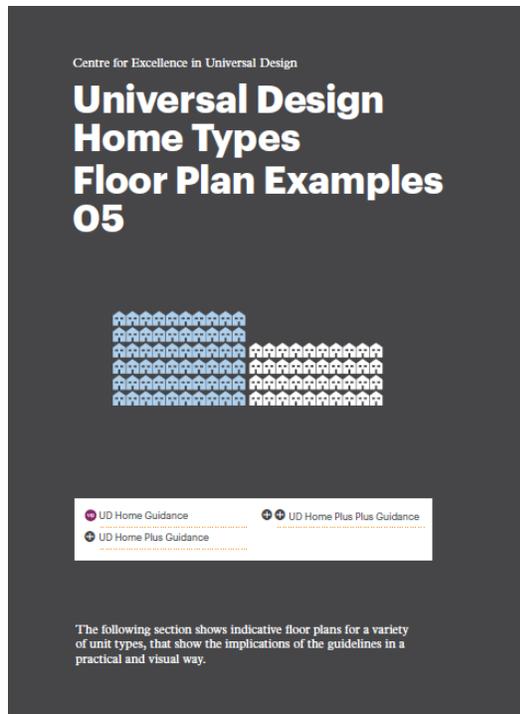
Living areas should be large enough for furniture to be arranged in different ways, and with enough clear, unobstructed space for movement and activities. Thoughtful design decisions can ensure that spaces are easier for everyone to use, and provide flexibility for future adaptations.

## Elements and Systems 04



- UD Home Guidance
- UD Home Plus Guidance
- Houses
- Apartments

The building elements and systems should create a comfortable home that is easy to manage and understand, and affordable to run. The UD Home should promote well-being and good health, and anticipate the changing needs of diverse occupants, including children and older people.



## **Research on Dementia and Home Design in Ireland**

The purpose of the *'Research for Dementia and Home Design in Ireland looking at New-Build and Retro-Fit Homes from a Universal Design Approach Key Findings and Recommendations Report'* is to inform the development of design guidelines, to guide built environment professionals such as architects, planners, landscape architects, quantity surveyors, engineers and builders, as well as health service professionals, on how to produce dementia friendly new housing or to retro-fit people's existing homes using a Universal Design approach. The research involved engagement with built environment professionals, health service professionals, people with dementia, their families and carers, as well as drawing on the body of literature in the field.

*There are about 48,000 people with dementia in Ireland. This number is expected to double by 2031. Although about two-thirds of*

*people with dementia are living in their own homes, there has been an absence to date in Ireland and internationally of design guidance for domestic dwellings for people with dementia, their families and carers. Aware of this gap, the National Disability Authority Centre of Excellence in Universal Design commissioned this collaborative research project combining expertise in dementia and in architecture.*

*The research was carried out by Trinity College Dublin's Living with Dementia programme in the School of Social Work and Social Policy, and TrinityHaus in the School of Engineering.*

*The research can be downloaded here;*

<http://universaldesign.ie/Built-Environment/Housing/Housing-research/>

## **The Universal Design Guidelines, Dementia Friendly Dwellings for People with Dementia, their Families and Carers**

This design guidance document is borne out of the research work mentioned previously, supports the Universal Design Homes for Ireland Guidelines and will help to inform national policy in Ireland. The Guidance provided can be used in practice by all stakeholders – those who commission, design, build, provide and occupy dwellings. If new dwellings or alterations to existing dwellings are built in line with a Universal Design dementia friendly approach, then they will help people to remain living at home and in their community independently and safely for as long as possible. This approach will also support family members and carers to sustain the caring relationship, particularly if these carers are older people or a person with a disability.



## Research on Universal Design of shared Educational Campuses in Ireland

The aim of this work was to carry out research into national and international best practice in relation to Shared Educational Campuses and to engage with key stakeholders in order to investigate how Universal Design can inform the planning and design of such campuses in Ireland for people of any age, size, ability or disability.

The research Briefing Note and full '*Research on Universal Design of Shared Educational Campuses Key Research Findings and Recommendation Report*' can be downloaded at this link;

<http://universaldesign.ie/Built-Environment/Shared-Education-Campuses/>

In response to the future use of the shared educational campus (SEC) approach in Ireland, a research study was carried out into the SEC model on behalf of the Centre for Excellence in Universal Design at the National Disability Authority. Based on an in-depth review of international best practice supported by interviews and workshops, the study found many benefits and equally many challenges facing the SEC concept.

The main findings emerging from the research include: firstly, the suitability of the SEC in terms of educational provision as opposed to individual schools; secondly, the location of an SEC and its integration with the community; and thirdly, the difficulties encountered finding suitable solutions to the integration of different educational and social communities on one campus. The fourth issue emphasises the importance of an engagement process that brings together key stakeholders across all sectors and at various spatial and administrative scales in a strategic and integrated planning approach that takes a long term view.

The final issue focuses on how the Universal Design (UD) approach can be used to frame an integrated response to the previous issues in terms of strategic spatial planning at a macro scale, and spatial master planning and the design of specific features at a site level.

### **Shared Space Design**

*"Shared Space, Shared Surfaces and Home Zones from a Universal Design Approach for the Urban Environment in Ireland"* explores contemporary national and international practices and thinking on Shared Spaces, Shared Surfaces and Home

Zones and to investigate these concepts from a Universal Design approach in the Irish urban environment. This report sets out key evidence based findings and provides key recommendations in relation to the implementation of Shared Spaces, Shared Surfaces and Home Zones in Ireland.

The Research and recommendations can be downloaded at this link;

<http://universaldesign.ie/Built-Environment/Shared-Space/>



**Neil Murphy MRIAI**



***Kevin Busby***

***Kevin has been a faculty member in the Department of Architecture at CIT for 17 years. He co-ordinates Year 2 and teaches Design Studio on the BSc (Hons) Architecture course at the Cork Centre for Architectural Education (joint CIT/UCC). He recently commenced a PhD in Architectural research at UCC with an interest in Lifetime Housing. He is also the Co-ordinator of Year 1 on the BSc Interior Architecture course in C.I.T. where he teaches Design Studio.***

***Kevin has been a registered Architect in the UK since 1989 and is a Chartered Member of the Royal Institute of British Architects.***

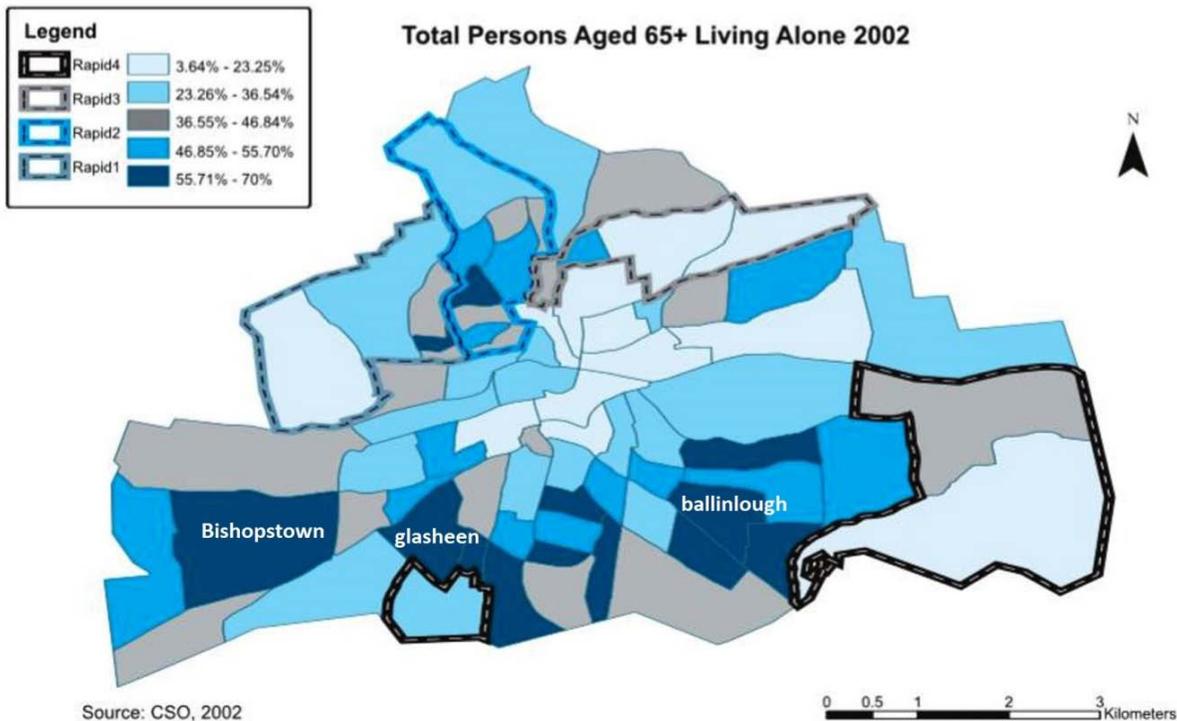
## **Isolation in Suburban Ireland**

*Kevin Busby*

One of the current areas of research in the Cork Centre for Architectural Education (CCAIE) is on the subject of isolation in the home for elderly occupants, focussing on the city and wider county. The 7 principles of UD promote the case for more usable environments and principle 1 considers provision for privacy, security and safety while being appealing to all users. This could be interpreted to include design that has psychological benefits to the user. To the isolated and lonely such design intentions should aim to be life-enhancing.

There is a well-established body of research documenting residential mobility. The search for more or different housing options is generally prompted by life-course 'triggers'. Specific triggers, in later life such as children leaving home, the death of a partner, accidents or medical/physical problems, are important life-course events. These are in turn translated into the need for, often smaller and more manageable dwellings, yet the prospect of such a move, late in life is especially daunting to those living alone or in poor health. Even when there is a realisation that the house they have lived in for many years is no longer suitable, there are significant emotional ties to 'place'. This attachment can be extended to the wider physical neighbourhood of friends and family members.

Cork city has the highest proportion of elderly residents in Ireland (Central Statistics Office)



The largest concentrations of elderly living alone occur in the southern suburbs of the city, indicated in dark blue on the above map, with figures reaching up to 70% of the residential population.

A significant proportion of the housing in the south western suburb of Bishopstown was constructed during the 1950s and 1960s, with further expansion up to the 1980s. Anecdotal evidence suggests that much of this new housing was initially purchased and occupied by families with young children. Good schools and local amenities were available, often within walking distance, while garages and driveways facilitated car-ownership. The parents would reach retirement age by the 1990s, the children having long departed to start their own families elsewhere. Suburban typologies of detached bungalows and 2-storey semi-detached houses with front and back gardens abound.



### **Author's sketch**

Front walls are painted, hedges clipped and front lawns immaculately mown yet there is, currently little sign of activity. Curtains and blinds tend to remain drawn across the front windows even on the sunniest of days. Longitudinal studies suggest that this is evidence of a cyclical pattern spanning many decades as the demographic of the residential area changes. Such circumstances draw various discussions about, for instance, the strain on the existing housing stock, but the immediate focus of our research is on improving the lives of the current occupants. Studies in the UK have suggested that there is a regard for independence among the elderly even at the expense of loneliness, in order to avoid the perception of 'being a burden' to the family.

The suburban typology of rows of houses with front and (often larger) back gardens with driveway to the side is familiar across the developed world. The nature of the opposing gardens is quite different in their use and meaning. The front garden is the threshold between the public and private realm, between involuntary social interaction and privacy/control. It is also described as the 'surveillance zone' by Graham Rowles (1981) and yet, in suburban

Cork, the front of the house often presents a blank face, with seemingly no engagement with the neighbourhood, either as 'defensible space' or for interaction. There is a tradition in Irish houses, particularly in rural areas where, predominantly the back door is used for access, whatever the occasion. The front façade and neat garden can infer, perhaps a sense of status but are there possibilities for opening up the façade, to bring in light and opportunities for watching the world go by, without fear of undermining a sense of security?

Initial proposals involve enhancing contacts within the age-friendly community to identify focus groups to aid in our research. Asking the right questions is one of the most important elements. This may take the form of a 'Housing History' (Peace, Holland and Kelleher, 2005) where residents would not only list the houses they have lived in throughout their life, but also relate life-course events and family details pertaining to each house. From this the respondent may gain a better understanding of the circumstances in which a house move or alteration is required.

Often elderly residents do not realize the options available to them, whether that be; adaptation of their home; suitable alternative housing typologies that maintain their independence; changes in occupancy where they may take in a lodger/student/grandchild to mitigate against loneliness.

A more phenomenological study from an architectural viewpoint would be to identify what physical characteristics of space, object and material have an emotional value to the resident. Again this is only possible by asking pertinent questions and we are currently

**working on a methodology to gather such data in an appropriate and ethical manner.**



***Kevin Busby***



*Linda Horgan graduated as an occupational therapist in 1988. She has worked in areas of mental health, intellectual disability, physical disability and community care. She has worked in diverse cultural settings of Ireland, UK, Australia and Saudi Arabia in contexts ranging from working in acute health settings, educational departments and community care.*

*She has post graduate qualifications in the area of Behaviour Therapy and Professional Studies from the field of Applied Psychology. In the area of occupational therapy she has completed a diploma in Occupational Therapy in a Community Setting and a Masters Degree in Occupational Therapy on the design of Health Care Buildings, both with Trinity College Dublin. Recently she has completed a Certificate in Traffic Medicine with the Royal College of Physican's in Ireland.*

*Currently Linda works part-time as a clinician in private practice in the area of environmental modifications and fitness to drive. She*

*Cork Centre for Architectural Education, Ireland*

*combines this with a part-time post on the academic staff of Occupational Therapy Degree Programme in University College Cork. Here, her interests in environmental design to enable performance and interest in fitness to drive form part of her research projects.*

# **Promoting Universal Design in Architectural Education**

*Linda Horgan*

The following is a condensed and edited version of a paper presented by Jim Harrison and Kevin Busby (Lecturers, Cork Centre for Architectural Education, UCC/CIT) and Linda Horgan, (Lecturer, School of Occupational Therapy, University College Cork) at the Universal Design in Education conference in Dublin in November 2015. The full paper is available for download through [arrow@dit](mailto:arrow@dit) as part of the Digital Commons Network.

## **Introduction**

Attitudes to disability have changed significantly in recent years, both in the public and professional domains, and continue to improve. There can be, however, no cause for complacency, especially in the design and provision of built environments for an inclusive future. Whilst product design and ICT can respond rapidly to such change, where products can be chosen to suit the individual user's needs, the built environment is more permanent and slower to evolve as well as having to provide for a much wider and general range of users, with differing skills and abilities. Universal design, although an internationally recognized way of thinking about the built environment, is not yet regarded universally as a fundamental principle in all design. Educators in courses for future construction design professionals thus have the responsibility for ensuring the continuing increase in standards of user-friendliness and safety, not only for future generations but in effecting such improvements now.

Schools of architecture and other related design disciplines are one of the main organs by which standards can be improved. This can be at all levels, from basic design modules through to continuing professional development courses. Upstream of these initiatives, research, publication and consultation can have a positive impact on the built environment in many ways. Universal design should, by definition, be such an integral basis of any project, of any scale or purpose that it would not need to be demanded. This requires a re-examination of design education teaching techniques to make improvements at appropriate levels.

### **Universal Design beyond Accessibility**

Historically, design has moved from complacency, through worthy attention for 'special needs', to accessibility and regard for barrier-free environments. Despite recent breakthroughs, universal design is really not 'rocket science' and hence should be understandable by everyone – as the basic principle states. Universal design goes beyond removing barriers and hazards to provide for a disparity of users 'to the greatest possible extent' and this may, at first, seem to be a greater challenge than just solving each access problem one at a time.

Bringing about any improvement in standards usually requires 'carrot and stick' approach, where awareness-raising needs to be backed up by mandatory codes. The 'stick' element would consist of legislation such as accessibility codes and 'deemed-to-satisfy' standards, to which the designer must adhere. While this approach goes quite a long way to reducing barriers and hazards, it cannot legislate for good 'inclusive' design.

Factual legislative topics such as Building Regulations are naturally taught in construction lectures, but if simply memorised by the student, without examples of application, the course is lacking in educational challenge. Universal design has ubiquitous application, but this in itself makes it difficult to legislate for, since it requires the kind of 'joined-up' approach that legislation on its own cannot give. Positive initiatives in the UK and Ireland, to require an 'Access Statement' or audits as part of planning applications have proved limited in success; often seen as simply a 'box-ticking' approach.

So, if legislative 'sticks' cannot beat good design into designers, what form of 'carrot' can be used instead? Clearly this is where the role of information and education becomes important. Initiatives aimed at the design professions, such as the NDA's 'Building for Everyone' and design competitions go a long way to promoting good design through explaining the logic behind many of the standards with which designers are faced.

A key point that differentiates Universal Design from Accessibility is that whereas the former is seamlessly integrated into the fabric of building or townscape, accessibility only provides an individual solution to each problem, rather than asking fundamental questions such as to the necessity for a flight of steps in the first place. Perhaps one of the most convincing arguments for teaching UD is that, if this is not seen as fundamental principle of design, buildings will continue to be scarred with insensitive add-on elements such ramps and handrails, where these are not properly integrated at design concept stage or supported by informed detailing.

## **“Why Universal Design?”**

Perhaps the most obvious question that we might then ask is “Why Universal Design?” If we can define the merits – and demerits – of the approach we might be able to understand better what these are, and in order to convince our otherwise skeptical colleagues, it may help to provide a convincing case. And there are still many skeptics and those who deny the value of UD or even accessibility.

Having to design to any standards may be seen as a hindrance to creativity; but this is the nature of architecture and without these constraints the built environment would be a dangerous and inhibiting place. Access legislation is but one more hurdle that the designer has to go through, as well as regulations on fire, energy conservation and other factors. But, whereas we hope that there will never be a situation to test fire safety, the application of universal design will be of immediate benefit everyone.

More significantly, these negative comments highlight the “them and us” attitude that accessibility provokes. Once universal design, as ‘design for our future selves’, is understood such division is less likely to be expressed. Now that we are all joining the “them” group by the fact that we are aging, we might take more cognisance of the fact that one of the major determinants of health is the built environment. The World Health Organisation have further developed this to include our rate of participation in the environment where we live as one of the two major factors of the quality of our health and lived lives (WHO, 2015). Architects are in a very powerful position and their awareness of their power over the quality and health of the population is little realized.

There are surprising insights about inclusion far back in the history of architecture.

Leon Battista Alberti, in the influential 'Ten Books of Architecture'(1955) criticizes architects for *"....choosing a platform not proper or convenient, without constant regard to the accommodation of the inhabitants, and not providing fit and suitable conveniences for every rank and degree of them, as well master as servants, citizens as rusticks, inmates as visitants: making your building .. too small and narrow; too open and naked, or too much shut in and confined; too much crowded or too rambling with too many apartments, or too few."* Elsewhere Alberti goes as far as to specify appropriate standards for both staircases and ramps!

Alexander and Pallasma, amongst others, cite related drawbacks in modernist design: the house as a machine for living rather than human-centred approach to design. There are, one would imagine, examples of modernist design that are accessible and could be studied in that context. A study of these would help to break down the misgivings that some of the academic staff may have about universal design. Aalto is a good example of a designer who could be said to advocate democratic design for all. The 'little man' was the term he used to describe the person who would inhabit and use his buildings and designs. *"We want to build up a social world where the 'little man' can have the highest possible qualities we can give him"* (AA,1950)

## Getting Universal Design into the Curriculum

It may seem obvious that there is a need to present teaching modules devoted to universal design as part of any design course.

Perhaps the strongest argument, however against this is that, in singling it out as a specific topic, it will tend to reinforce the attitude that it is somehow separable from regular design. Although there are advantages in modular courses for many disciplines, it is counter to the way in which architectural design is best taught. Singling out such a fundamental and obvious principle in design is likely to have the negative effect of making it appear to be an optional add-on.

A more effective way to inculcate inclusive thinking into the student mind is by a more subtle and concerted approach. Both Welch and Preiser refer to this as “infusion” (Welch, 2001, Preiser, 2001). Remembering that most courses in architecture and related disciplines are based largely on project work, the way that briefs are formulated is hugely important in teaching universal design. Briefs at all levels, from Year One to taught Postgraduate level should introduce aspects user-needs and inclusion as a design requirement. Challenging students to formulate a visual and functional profile of the general population and the specific population of users will equip them with more information on designing for function. Challenging them to define disability and difficulty may widen their visual lens and they may discover that many of them fall into that bracket. For instance, how many of the class wear glasses, but can they work without them?

By reappraising the teaching methods/techniques currently in use in the school, and working with colleagues who are like-minded, tutors can identify points at which emphasis can be made to universal design/inclusive design, infusing the topic in appropriate degree.

## **Raising Awareness on Universal Design**

**Students in their late teens and early twenties are often unaware of the level of disability around them as the user groups are often an invisible population in society. A walk around the centre of Cork at lunchtime would suggest, mistakenly, that disability figures are greatly exaggerated. A contributory factor to this level of invisibility is the design of the physical environment - a direct result of inaccessible public space. Engaging the students with user groups particularly within their own age bracket, through design projects or research, will increase their understanding of the challenge of designing for all.**

**In embarking on any awareness-raising exercises. It can be telling to ask students to state their preconceptions of UD, access and disability, before embarking on any activity and then, afterwards the participants can see the extent of their learning in the intervening time. This opening and closing ensures ethical considerations are covered when discussing particular groups and how they are considered in design research.**

**From the authors' collective experiences, teaching at tertiary and professional level, working with 'Training the Trainers' workshops, and in design consultation and practice, the following suggestions are given on some possible ways of sensitising and raising students' awareness of the barriers and hazards that users face, through observation, simulation or experiential exercises, as well as integration into project work at different stages in their education.**

## **The 'Critical Eye' and the 'Appreciative Eye'**

Even as experienced educators we should be constantly learning new and useful ways to teach, to pass on information and to inspire change of attitude. A useful method of enquiry encourages participants to see the built environment with both a 'Critical Eye' and an 'Appreciative Eye'. This technique, used in management training, refers to 'critical learning' in much the same way as designers work, often intuitively. The technique is simple but effective in that it allows us to see anything in a variety of ways. In awareness-raising when examining a particular environment we only see the barriers or poor or missing design features, as these stand out. The 'Critical Eye' may teach us what NOT to do, but it is less helpful to us in shaping a better design strategy. Consider then countering the negatives, using our 'Appreciative Eye' to identify the positive aspects, which can be instructive and provide good examples to develop.

One of the great virtues of good inclusive design, however, is that, when done well, it is inconspicuous and so needs a more trained eye to identify it. Often this is a statement of the obvious: we may not feel we need to comment on the walkway that is flat and barrier free and, although we cannot necessarily know how it was achieved, it may have taken the designer quite a lot of hard work to make it look so natural. It may also take an experienced eye to 'see' what is NOT there: the missing handrail or visual contrast on a step, for instance.

In order to develop the critical/appreciative eye (also a valuable tool in many other aspects of design evaluation) some degree of guidance is necessary. Someone with an experienced eye such as an

informed tutor or activist will need to initiate the process by pointing out these discreet things.

## **Experiential and Simulation Exercises**

Simulation exercises involve the placing of subjects (in this case students of architecture) into situations where they have to face barriers and inconveniences at first-hand, by equipping and restricting their movements and/or senses by various means, from a simple blindfold, noise defending headsets or a leg-splint, to the use of a wheelchair. In order to be effective, the exercise should be sustained over as long a period as possible, with a planned route or set of objectives. Typically a group of 3 students would work together, one experiencing, one recording, photographing and taking notes, while the third member acts to guide and ensure safety.

A number of the studies have been undertaken about disability simulation exercises, with various results. What is consistent is that for simulation exercises to be successful they must be well designed with the risks and benefits weighed. The use of simulation exercises gives the participants a personal experience of what it is like to have a physical or sensory impairment. It is this personal experience of impairment that gives the participants the confidence to identify usability problems and barriers to participation. The involvement of end users gives architects and designers an understanding of the difficulties experienced by people outside their own physical, social and economic background.

Horgan & Mahon (2015) in an undergraduate study found that overall review of the literature highlights that it is not about doing or not doing simulations, but 'how' you do them which will determine how effective they can be (Lewis, 2009). Simulation

exercises must be planned carefully and well-designed in order for them to be effective learning tools (Lewis, 2009). Proper briefing and debriefing sessions, both on the correct use of assistive devices and on the experiential and ethical aspects of the exercise are important (Harrison & Parker, 1997).

Even where a full simulation exercise is not undertaken, having a simple self-propelled wheelchair in the studio may help students to see this as an everyday piece of personal equipment, to use it and experience the need for adequate space in planning any building.

### **Teaching and Learning: Project Topics**

Design Project work is the mainstay of architectural design education and if this is to rise above conceptual thinking there may be requirements in certain key design projects for students to provide evidence to explain design decisions related to technical issues such as construction, specification and detailing, or energy and sustainability matters; the requirement to demonstrate an access strategy, no matter how simple, should be a prerequisite.

In both architecture and interior design courses in Cork, Universal Design is introduced to students in the early years of the programme through design projects in the Design Studio module. The projects are generally based around the domestic environment, from individual apartment spaces to multiple housing units. Technical aspects such as Building regulation compliance are covered in cognate modules in Applied Technology. As a primer the students research the anthropometrics around the variations of the physical body within their class group and the ergonomic factors that are influenced by the space and objects around them, leading to a human-centred design approach. The students are encouraged to

look beyond the basic access requirements of the building regulations and are introduced to lifetime housing standards.

Such projects tend to be seen as unrelated to the student's own experience, sometimes simply as exercises in geometry and space planning. To counter this year 2 students in Architecture are asked to consider their own family home from a number of viewpoints. In particular they are asked to investigate how the network of relationships and patterns of behaviour that make up the 'family,' affect and are influenced by the nature of the dwelling spaces that are described as 'home'. They are asked to comment graphically on a number of criteria such as: comfort and necessity; security and vulnerability; interaction and retreat. From analysing how finite space is adapted over time with the changing needs of the family, the students are then asked to propose adaptations and re-use of the home.

In Year 4 students undertake a dissertation which is preceded by seminar groups where related texts are read and discussed. Universal Design related themes are included within a wide ranging architectural discussion and tend to be at a more informed level.

### **Teaching and Learning: the 'Crit'**

The review (or 'Crit') remains one of the key teaching tools in any design course, but its application is often limited to short critical commentary on each individual's pinned-up drawings. By including panel members who are not necessarily designers, but rather people who have particular personal experience, such as spokespersons for disability user groups, a fresh and focused view will be introduced.

One memorable student review experienced by this writer was when a visiting academic came down heavily on a student's poorly-considered plan: "Who do you want your building to exclude?" he asked, pointedly.

## **Role Play**

As an alternative to the regular review of student work, the value of role-playing is worth experiencing; each student (or groups of students) is given an outline of a character. The character is described in general terms (e.g. "Mrs Smith, 82 years old, with failing sight and typical range of physical limitations for her age; she lives alone and values her independence"). Students are further required to investigate the particular needs of their allotted individual and the way that the built environment may help, hinder or endanger them. They are then asked to play that role as members of the review panel in order to highlight the pros and cons of their fellow-students' designs.

## **Working with Occupational Therapists**

Useful allies in understanding the diverse needs of users, the profession of occupational therapist remains largely unrecognized by architects, which is regrettable. From the authors' experiences there is much to be learned from a profession that considers the living zones of individuals just as much as do architects. Such exchanges of skills and experience can prove beneficial.

## **Design Diary and Access Mapping**

Where an experiential exercise has been carried out, the impact of this will be sustained if students are required to keep a 'design

access diary' – a sketchbook into which they record the positive and negative planning and design features that they are now sensitized to recognize. Mapping parts of the city is a regular student exercise, to explore and communicate the diverse nature of the built environment, even where we think we are familiar with it. To be able to understand how people with different abilities will experience any environment is surely a requisite skill for designers. An example of such work was carried out by Year 4 students at the National University of Singapore. The students were inspired to identify barrier-free connecting routes and external facilities between accessible buildings for tourists with access needs, designing a practical map which was then included in an up-dated publication from the Tourist Board.

## **Exemplars**

Well-integrated examples of universal design may be difficult for anyone who does not have an experienced eye to recognize or understand; a positive response to this would be to develop a better reference source of good examples, complete with technical explanation and comments on each one. Here the 'Critical Eye' and 'Appreciate Eye' technique might be a useful approach.

## **Design and Research Opportunities**

Thesis and Research topics demand a higher level of two-way exchange between teaching staff and students. Students in higher years of the programme investigate various topics for thesis or dissertation relating to current and future trends in design, such as the Lifetime Home concept and future developments in housing provision, adaptive and sensor technologies.

## **Consultation: Live Projects**

Many schools of design include 'Outreach' projects for students, wherein local or social design opportunities are explored. Schools of architecture have a useful role to play in the community, acting as resource centres in various ways, such as providing advice on building adaptations for groups representing the disabled community.

## **Conclusion**

The most enduring and effective way to get universal design thinking into all branches of architectural education, no matter how simple, requires a measured approach. Apprising those tutors in charge of writing the design programmes, is a key factor and may be one of the more difficult, though achievable tasks. Where there is a turnover or re-allocation of staff it is important to maintain the message. Raising awareness of universal design relies greatly on the enthusiasm of particular individuals - a potential weakness as momentum may be lost when a staff member moves on, unless another committed and experienced individual steps in. Thus it is important to 'pass the baton' to like-minded fellow tutors in advance, to give them the confidence and resources to sustain the effort.

Equally, in the wider community schools can make positive moves in identifying and working with partners and personalities in the promotion of UD in education; these could be academic staff members, possibly from different disciplines and schools, such as Occupational Therapists, members of user groups or NGOs. Informal networks naturally occur, but reinforcing these ties is important to

**both widen the knowledge base and to diversify the impact to the wider community.**



***Linda Horgan***



## Forthcoming Issues

### March 2017 Vol-12 No-3

#### **Bonollo, Emeritus Prof. Elvio**

**Emeritus Professor, Industrial Design Faculty of Arts & Design is one of Australia's leading industrial design educators and researchers.**

**In 2008 he was conferred with the Honour of Cavaliere by the President of the Republic of**

**Italy in recognition of his collaborative work in design and education. He is emeritus professor of industrial design at the University of Canberra (UC), and recently visiting professor in the School of Design and Environment (2004 -2007), and the Department of Mechanical Engineering (2007) at the National University of Singapore (NUS) will be the Guest Editor**



### April 2017 Vol-12 No-4

**Dr. Sandeep Sankat Associate Professor, Department of Architecture, School of Planning & Architecture, Bhopal India will be**



the Guest Editor.

## **May 2017 Vol-12 no-5**

**Ravishankar is a Sr. Faculty member, Coordinator, M Des Universal Design Program at National Institute of Design, Bangalore and has authored the curriculum and the course modules. He offers courses in Design Methodology, Universal Design Thinking, Experience Design and mentors design projects in Product design, Digital Interfaces & Media and Retail. He has co-authored the Universal Design India Principles UDIP.**



He also coordinates the NID-MSME Design Clinic Scheme for the South Zone. He is a recipient of the Business World - Design excellence award in 2006. He has been a Jury member of the India Design mark 2015& 2016 of the India Design Council, Mahindra Rise Design Challenge 2015 and has been a proactive enthusiast in promoting Design Thinking among Industry and academia through various workshops and will be guest Editor.

## **June 2017 Vol-12 No-6**

**Dr. Gaurav Raheja Associate Professor, Department of Architecture & Planning Joint Faculty, Centre for Excellence in Transportation Systems Indian Institute Of Technology (IIT)**



Roorkee, Uttarakhand State, India will be the Guest Editor

## **July 2017 Vol-12 No-7**

**Mark Watson** was chosen from an international field of Designers to participate in the International Society of Councils of Industrial Design Interdesign Workshop, a two week workshop looking at Smart City solutions to social, environmental and economic problems in Mumbai .



Mark has a 15 year long engagement with Design in India presenting at leading Design Conferences on Design Thinking and Experience Design and is currently adviser to the Indian Design Festival.

Mark Watson MDIA Managing Director Design Providence <http://www.designprovidence.com.au> Lead Partner Design Thinkers Group Australia <http://www.designthinkersgroup.com/> Co-Founder Indo Australian Design Research Alliance <https://www.>

## **September 2017 Vol-12 No-9**

**Prof Lalita Sen, Ph.D.** Department of Urban Planning & Environmental Policy Texas Southern University Houston, Tx 77004 will be the Guest Editor.



## **October 2017 Vol-12 No-10**

**Dr. Sushma Goel, Associate Professor at department of Resource Management and Design Application, Lady Irwin College, Delhi University has been teaching from past more than three decades. She has authored subject manuals, modules for distance education, text**

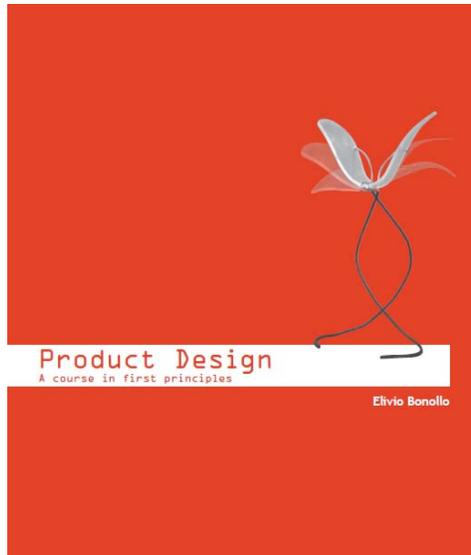


**book, etc. She has several publications in national and international journals to her credit. She has been supervisor for 60 masters' dissertations and 9 doctoral researches (some ongoing). She had been principal coordinator for projects with DDA slum wing, DST, Ministry of health and family welfare, Ministry of social Justice and empowerment and Delhi University Innovation projects.**



## Disability, Rights Monitoring and Social Change:





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[http://www.amazon.co.uk/Product-Design-course-first-principles/dp/1784562939/ref=sr\\_1\\_fkmr0\\_1?m=A2U321JN96E0UZ&s=merchant-items&ie=UTF8&qid=1456434788&sr=1-1-fkmr0&keywords=Bonollo+Prrodukt+Design%3A+A+course+in+first+principles](http://www.amazon.co.uk/Product-Design-course-first-principles/dp/1784562939/ref=sr_1_fkmr0_1?m=A2U321JN96E0UZ&s=merchant-items&ie=UTF8&qid=1456434788&sr=1-1-fkmr0&keywords=Bonollo+Prrodukt+Design%3A+A+course+in+first+principles)

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#### Product Description

In this book, Etlvio Bonollo takes us on a 'learning journey' about design including a scholarly explanation of the characteristics and power of the design process. It provides valuable insights into the attitudes, knowledge and skills that underpin the design discipline at an introductory level of expertise, and has been developed to meet the needs of aspiring designers in many areas including industrial design, design and technology, art and design and architecture. Etlvio uses an operational model of the design process - along with related educational strategies, learning outcomes and an ordered set of design briefs - to develop a systematic, problem-based method for learning design from a first principles viewpoint. The beauty of this approach is that it brings structured learning to aspiring designers whilst being mindful of diverse cultures and backgrounds. Each part of this book encourages self-expression, self-confidence and exploration: it is has been carefully designed to take the reader on a highly motivating journey of design thinking and creativity, supported by excellent sample solutions to design problems, lucid discussions and extensive references. These solutions, developed by design students, serve as novel examples of how to solve real problems through innovative design without restraining creative freedom and individual personality. The design learning method and strategies in this book will greatly assist design and technology teachers, students of design, aspiring designers and any individual with an interest in professional design practice.

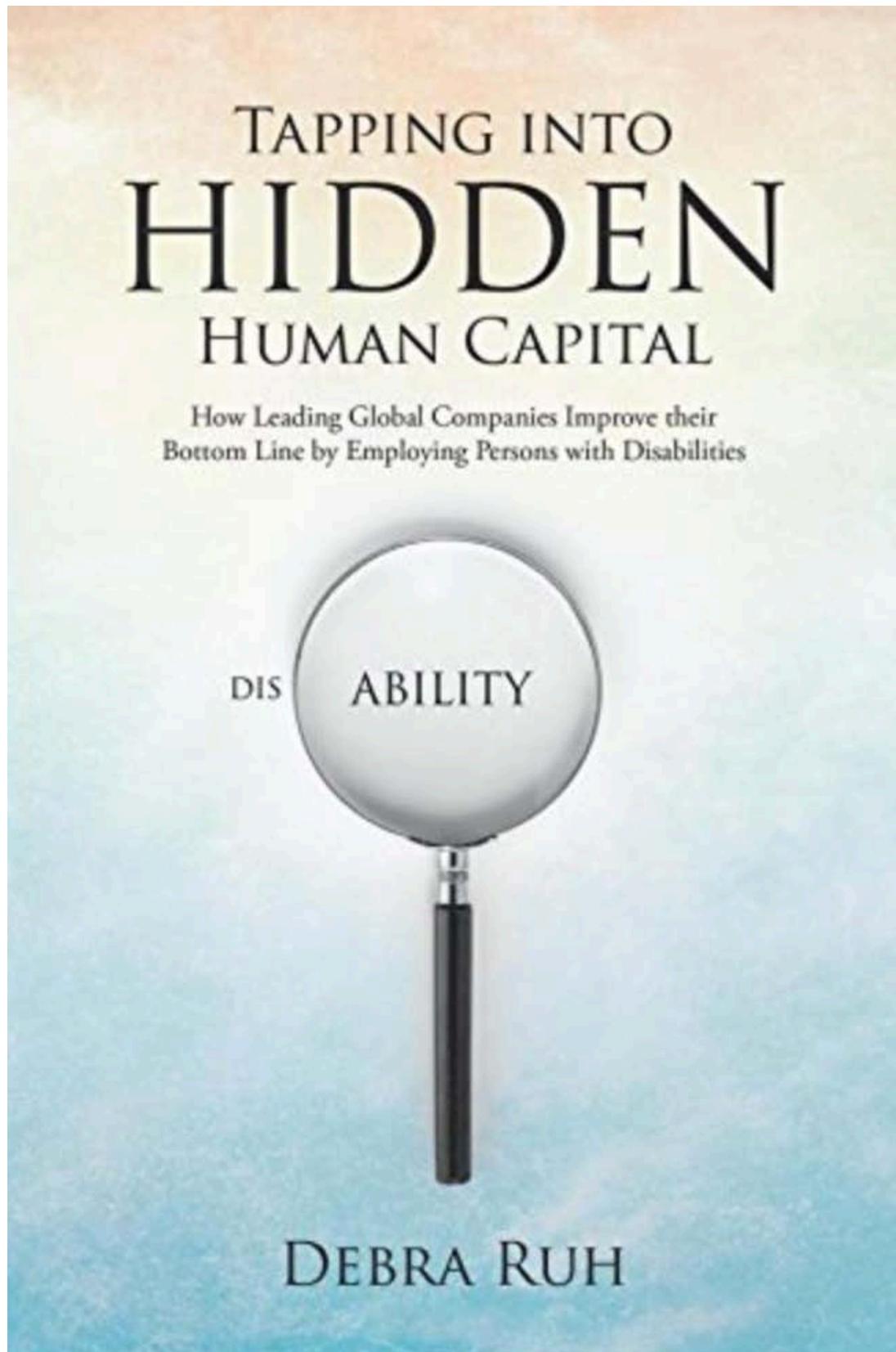
I cannot recommend this book highly enough, it was a complete lifesaver throughout my undergraduate studies and honours degree and now continues to serve me well as I move into industry practice. The content is easy to understand and follow, providing a practical guide to understanding design principles and every aspect of the design process. It includes great project examples and reflects the wealth of knowledge and experience possessed by this accomplished educator. I have purchased multiple copies of this book for peers and would suggest any student who is studying a design discipline to pick up their own copy as this has quickly become the most useful book in my design collection.

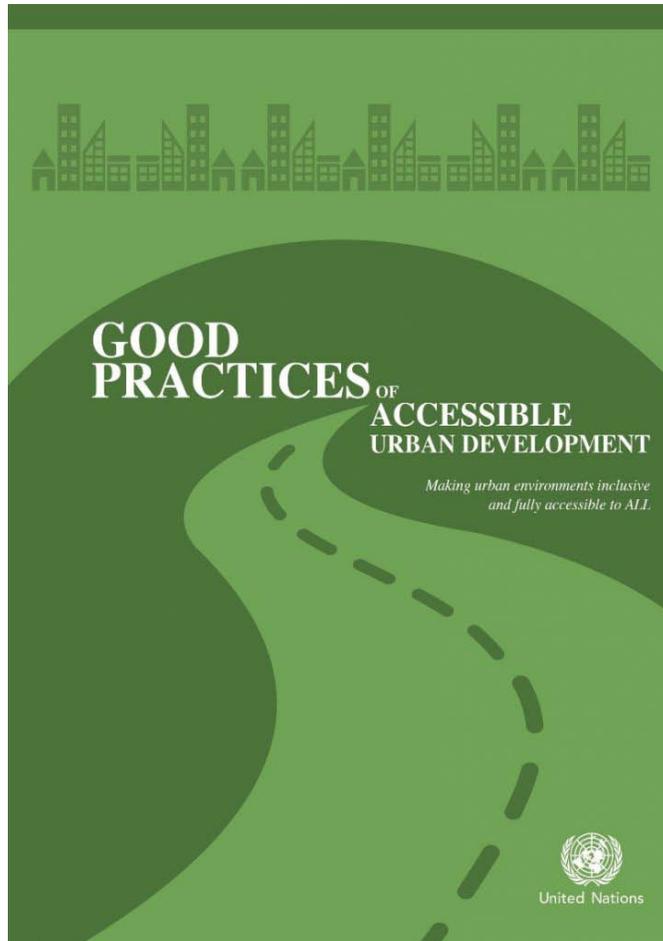
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★★★★★ A 'Must Have'.

By Amazon Customer on 7 April 2016

As a Design Education professional of many years standing, I endorse this book without reservation. It is comprehensive, lucid and above all, useful in a very accessible level at the coalface. Professor Bonollo has an enormous cache of experience as an engineer, designer and design educator and his experience is well demonstrated in this book. A 'must have' for anyone in the business of educating or being educated in the product design arena.





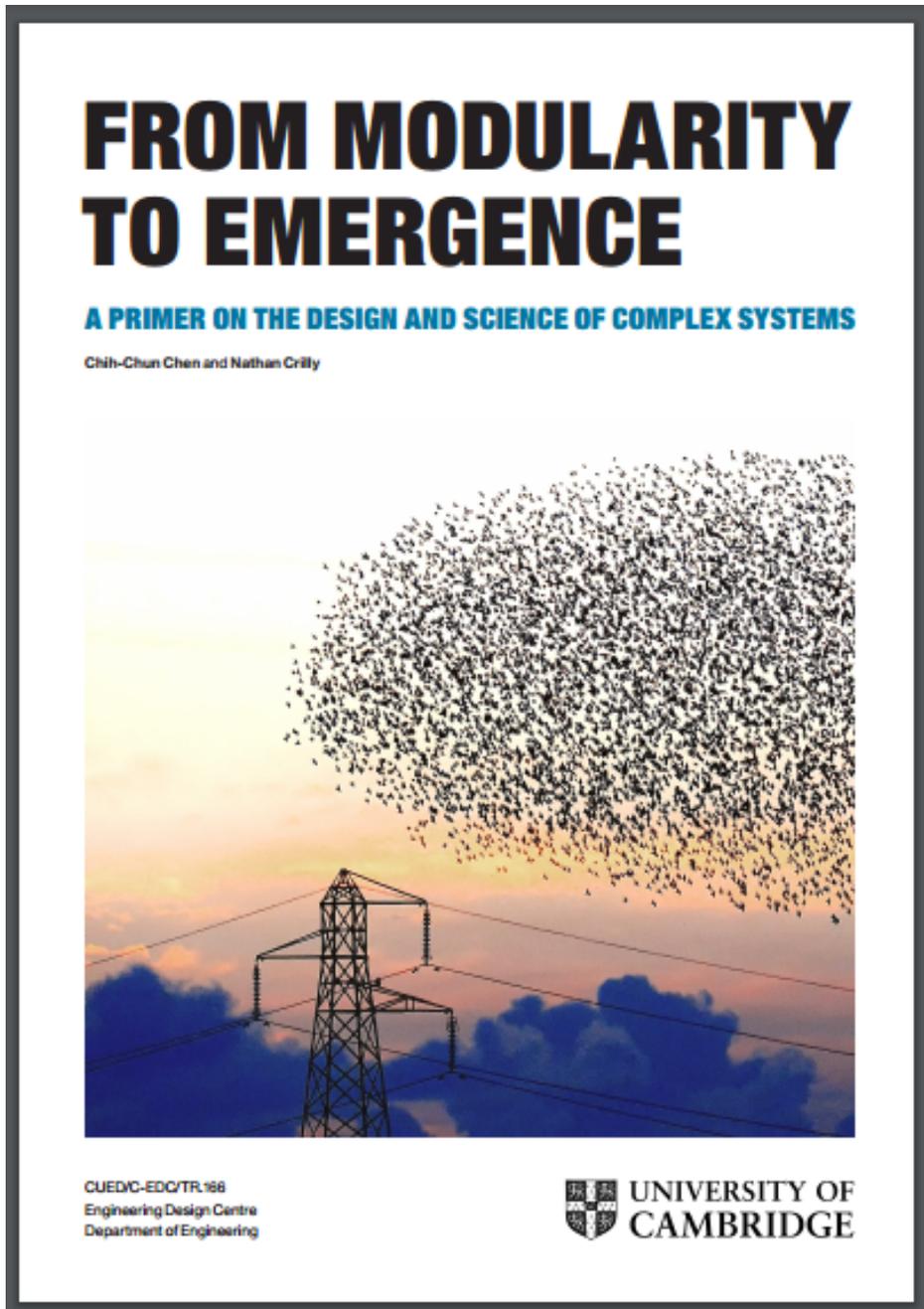
**In light of the forthcoming United Nations Conference on Housing and Sustainable Urban Development (HABITAT III) and the imminent launch of the New Urban Agenda, DESA in collaboration with the Essl Foundation (Zero Project) and others have prepared a new publication entitled: “Good practices of accessible urban development”.**

**The publication provides case studies of innovative practices and policies in housing and built environments, as well as transportation, public spaces and public services, including information and communication technology (ICT) based services.**

**The publication concludes with strategies and innovations for promoting accessible urban development.**

**The advance unedited text is available**

**at:**[http://www.un.org/disabilities/documents/desa/good\\_practices\\_urban\\_dev.pdf](http://www.un.org/disabilities/documents/desa/good_practices_urban_dev.pdf)



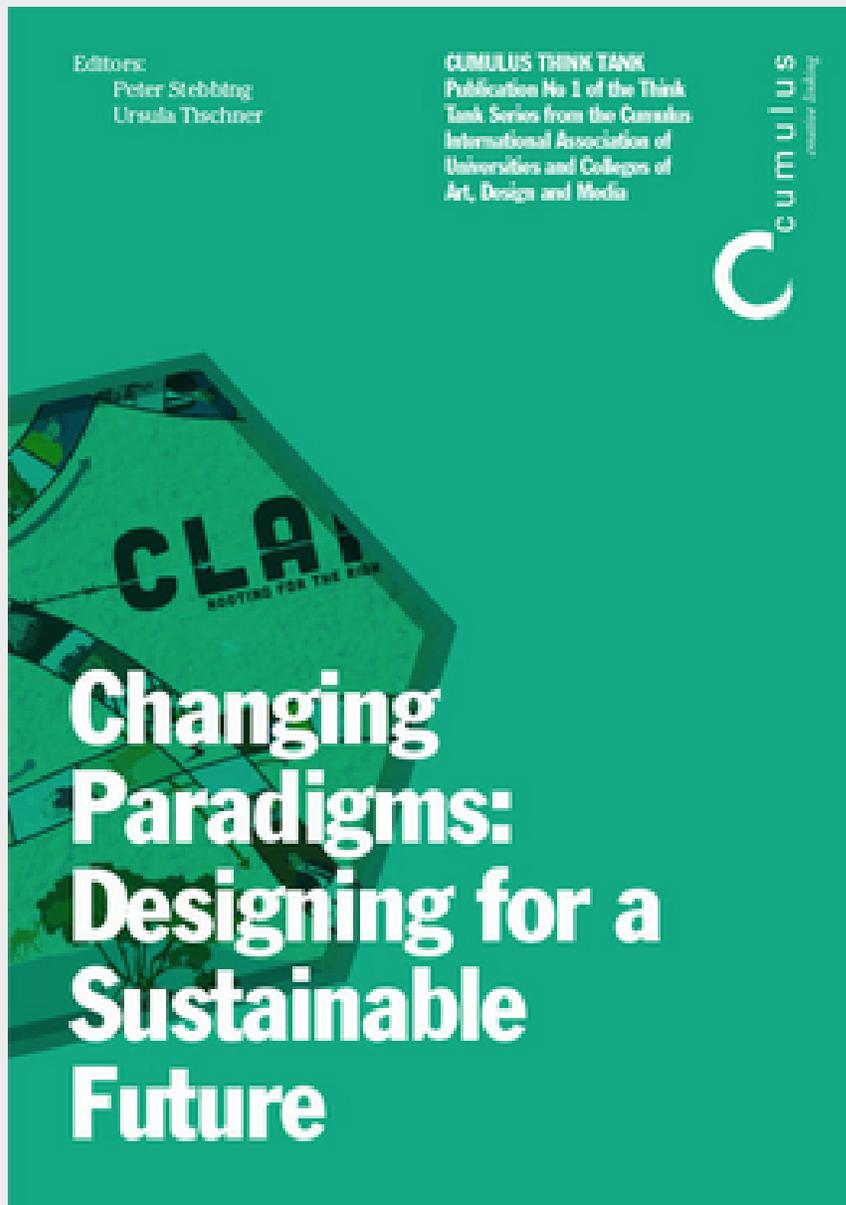
**Dr Chih-Chun Chen and Dr Nathan Crilly of the Cambridge University Engineering Design Centre Design Practice Group have released a free, downloadable book, A Primer on the Design and Science of Complex Systems.**

**This project is funded by the UK Engineering and Physical Sciences Research Council (EP/K008196/1).**

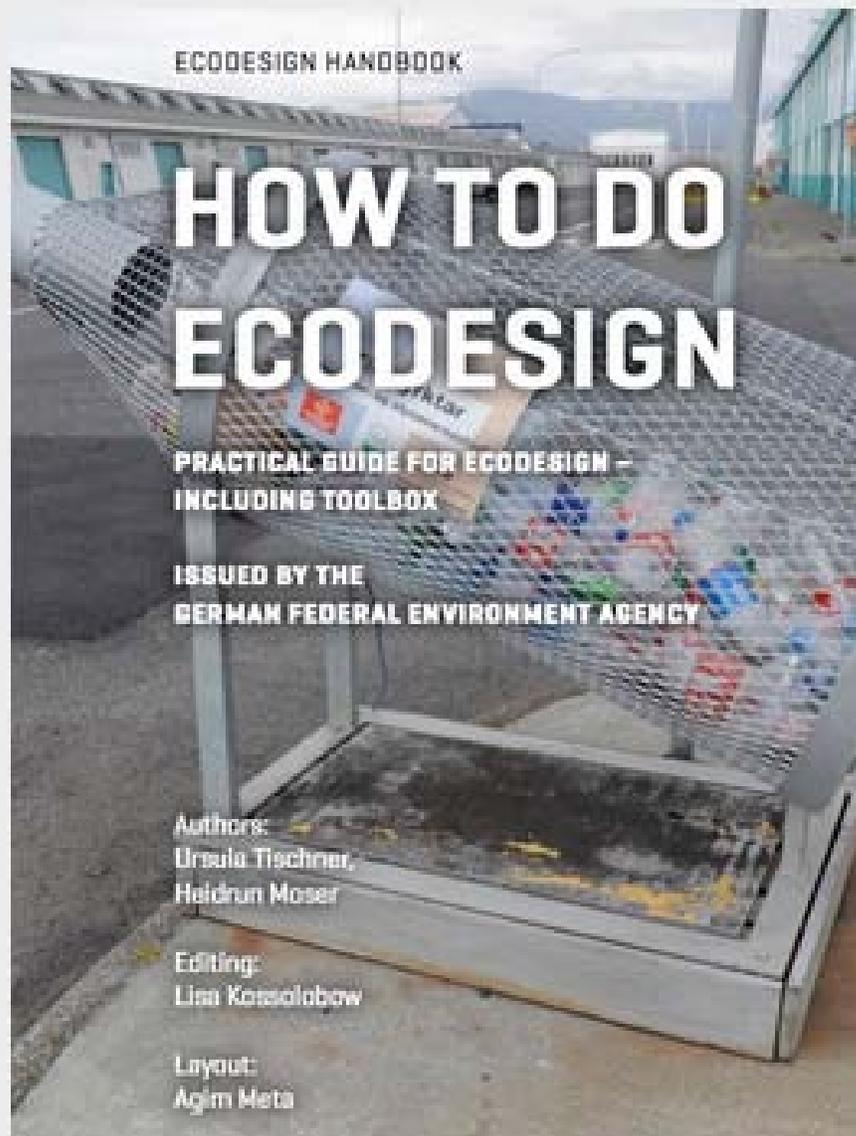
**The book is available at URL:**

**<http://complexityprimer.eng.cam.ac.uk>**

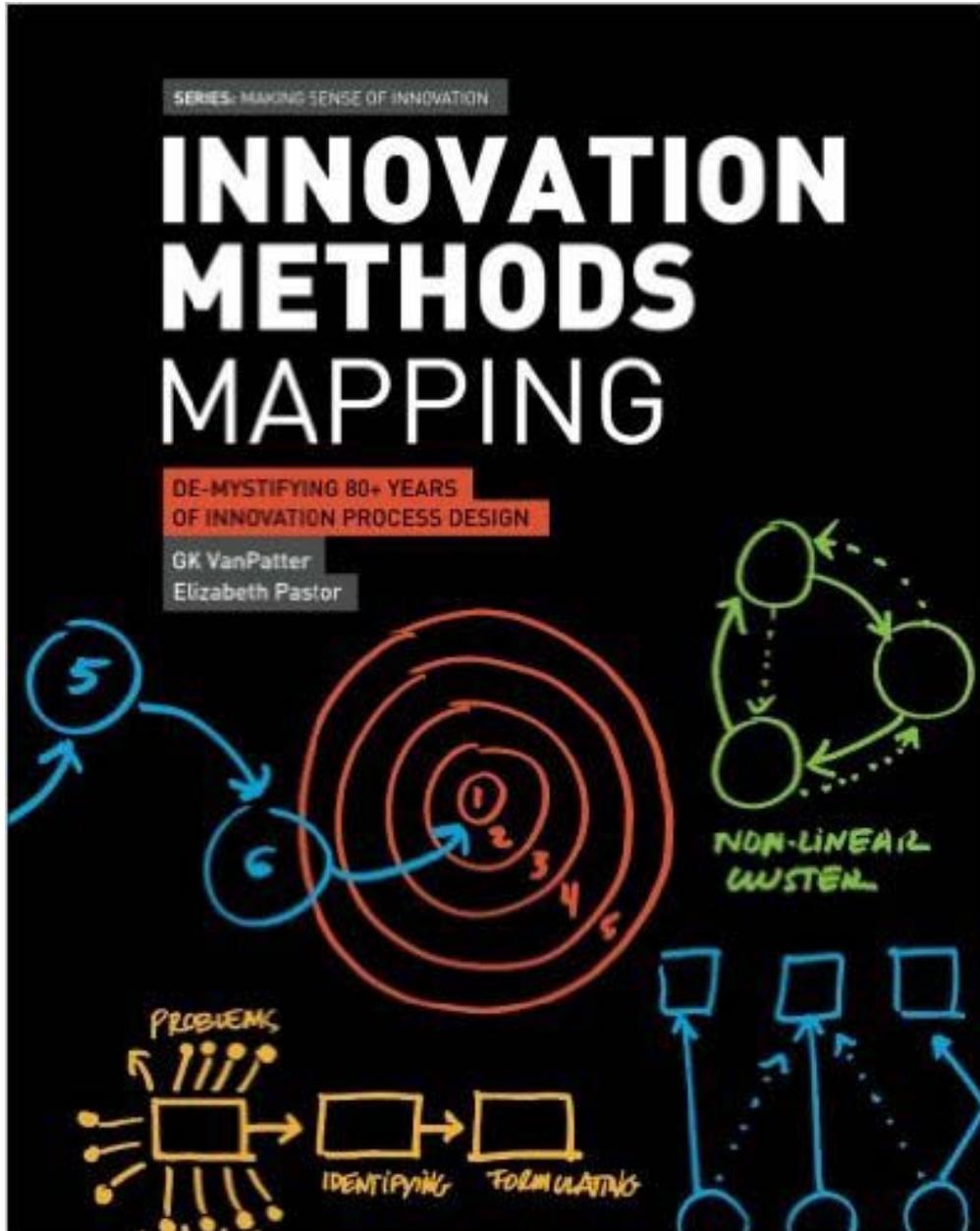
# Changing Paradigms: Designing for a Sustainable Future



## **New iBook / ebook: HOW TO DO ECODESIGN**



Practical Guide for Ecodesign – Including a  
Toolbox  
Author: Ursula Tischner

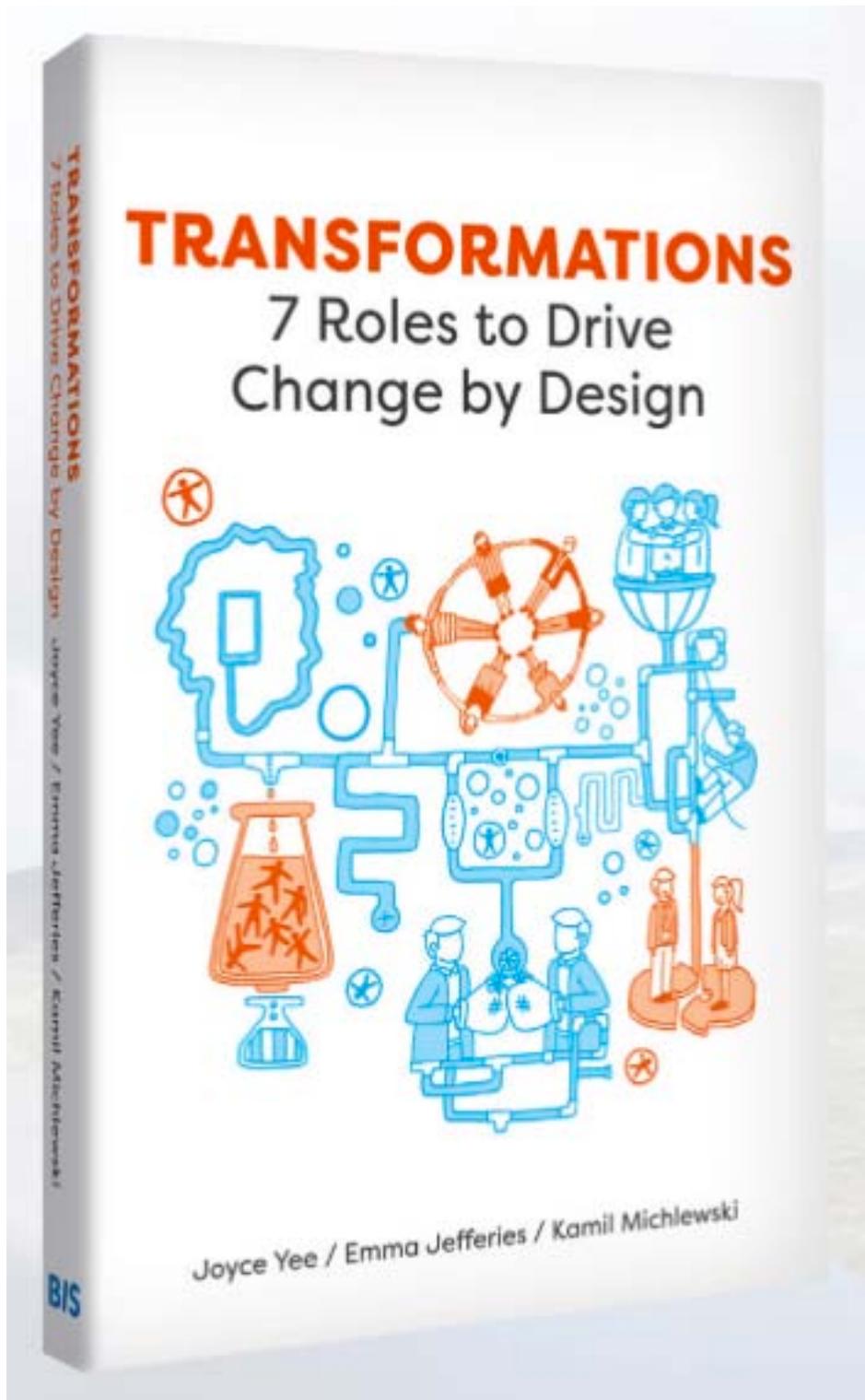


Humantific's new book: Innovation Methods Mapping has just been published and is now available on Amazon.

[https://www.amazon.com/dp/1540788849/ref=sr\\_1\\_1?ie=UTF8&qid=1482329576&sr=8-1&keywords=Humantific](https://www.amazon.com/dp/1540788849/ref=sr_1_1?ie=UTF8&qid=1482329576&sr=8-1&keywords=Humantific)

You can see the preview here:

[https://issuu.com/humantific/docs/innovation\\_methods\\_mapping\\_book\\_pre](https://issuu.com/humantific/docs/innovation_methods_mapping_book_pre)





# Appeals

## ICT Accessibility Policy Available for Open Comment

Among the *short-term recommendations* made by the Chancellor's *Workgroup on Diversity and Inclusion* was the adoption of a Universitywide policy on information and communication technology (ICT) accessibility. A broad-based University committee has met monthly since April 2015 and completed a draft of the policy that has been reviewed by the provost and the senior vice president and chief human resources officer, and faculty and student stakeholders. The policy is now available for review and comment on the University's *technology accessibility website*. Once the comment period has closed, feedback will be reviewed and considered. The policy will then be vetted by the University's Policy Advisory Committee as set forth in the *University's policy process*.



To encourage discussion and understanding of the policy and its ramifications, four public comment sessions will be held. Sessions are scheduled as follows:

Monday, Jan. 23, 10-11:15 a.m., 500 Hall of Languages

Thursday, Feb. 2, 3:30-4:45 PM, 500 Hall of Languages

**Wednesday, Feb. 22, 3-4:15 p.m., Peter Graham Scholarly Commons,  
114 Bird Library**

**Tuesday, Feb. 28, 9-10:15 a.m., Peter Graham Scholarly Commons,  
114 Bird Library**

**All University faculty, students, and staff are welcome to attend. CART and ASL services will be provided. All attendees are encouraged to become familiar with the policy, available on the University's [technology accessibility website](#).**

### **About the Information and Communication Technology Accessibility Policy**

**The policy is designed to ensure that all people can effectively access University content on information and communication technologies (ICT). These comprise equipment, systems, technologies or processes for which the principle function is the creation, manipulation, storage, display, receipt or transmission of electronic data and information as well as technology-based equipment.**

**Included are:**

- **academic and administrative software applications**
- **websites, web-based and mobile applications**
- **interpreting services for events**
- **email and electronic documents**
- **search engines and databases**
- **multimedia (audio and video)**

**The policy states:**

- **ICT services and products shall be accessible to individuals with disabilities.**
- **ICT shall adhere to International (Web Content Accessibility Guidelines 2.0 AA) and Federal (Section 508 of the Rehabilitation Act of 1973) standards.**
- **Events on campus shall be accessible and enable full participation**

**Priority areas include:**

- **course content: documents, video and library reserves**

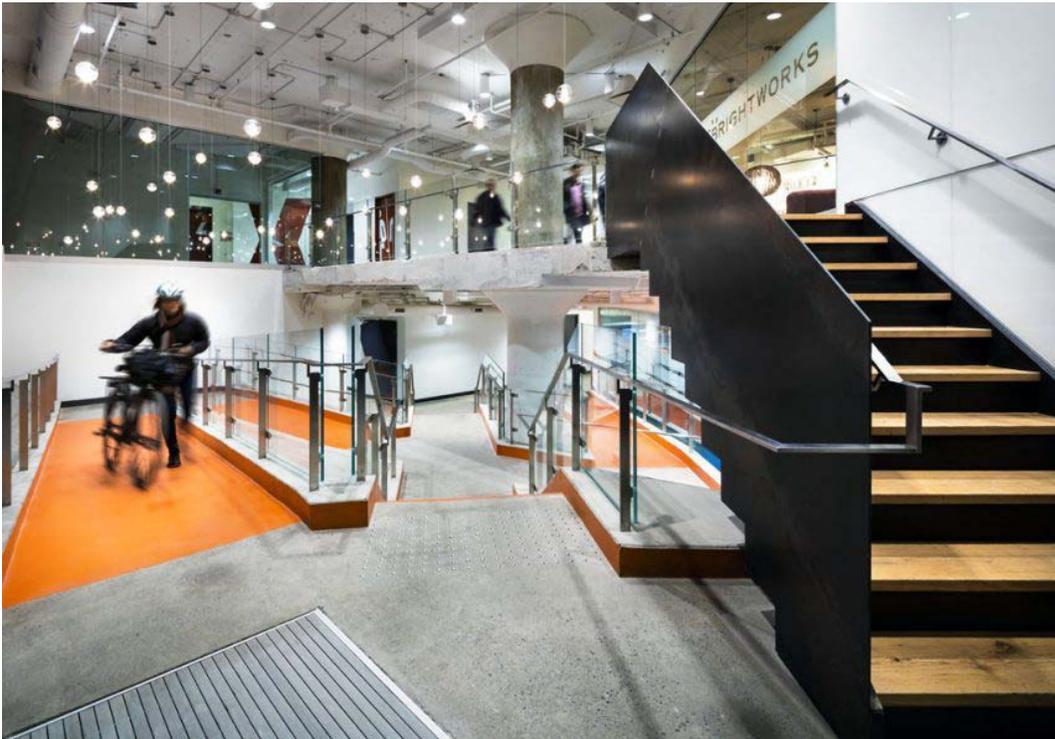
- **University websites and associated documents**
- **public non-academic video and audio resources**
- **auxiliary aids and services for University events**
- **library multimedia resources**
- **procurement of information and communication technology**
- **oversight and support for sustaining ICT accessibility**



# News

1.

## Winners announced for 2016 International Association for Universal Design Awards



*100 Broadview by Quadrangle Architects. Photo: Brandon Barre*

The winners of the sixth annual International Association for Universal Design (IAUD) Awards have been announced, including two Canadian winners.

The objective of these awards is “to contribute to the healthy development of society, and improve the welfare of humanity as a

whole, through further disseminating and actualizing of universal design." Featuring 16 diverse entry categories, the awards program acknowledges both groups and individuals around the world who are proposing and creating new products, systems and urban development initiatives that promote accessibility for all.

The Canadian Museum for Human Rights received a Gold Award in the category of Public Space Design for The Inclusive Museum. Designed by Antoine Predock (Design Architect) and Architecture49 Inc. (Executive Architect), the museum is the first in the world solely dedicated to the evolution, celebration and future of human rights. Using multimedia technology and other innovative approaches, the CMHR creates inspiring encounters with human rights for all ages.

Quadrangle Architects was recognized with a Silver Award in the Architecture category for 100 Broadview Lobby. 100 Broadview, an adaptive-reuse renovation that converted a storage facility into a commercial rental building, had an inaccessible entranceway that lacked street presence and visibility. Recognizing the value of a building with a fully inclusive entrance and a bold identity, the building's owner gave up leasable space in order to transform the entryway into a striking statement at grade, with a series of ramps that demarcate the property as a creative hub open to strollers, bicycles and mobility devices. Quadrangle's solution for the 100 Broadview Lobby effectively uses universal design on a number of levels to welcome those with vision loss and all levels of mobility.

*(Source: Canadian Architect)*

2.

## **Earthquake experiences of people with vision disabilities documented.**

Residents with vision disabilities faced further challenges that have now been documented by Massey University's Dr Gretchen Good and Dr Suzanne Phibbs of the College of Health in research which explores the experiences of 12 residents with vision disabilities who lived through more than 12,000 aftershocks.



*Dr Gretchen Good with her assistance dog Caz, and Dr Suzanne Phibbs. Photo: Massey University*

The study, *Disorientated and Immobile: The Experience of People with Visual Impairments During and After the Christchurch, New Zealand 2010 and 2011 Earthquakes*, was recently published in the *Journal of Visual Impairment & Blindness*. It involved 12 face-to-face interviews conducted after the September 2010 quake, but prior to the fatal 2011 February quake. Then, in February 2012, seven of the original participants were re-interviewed about how more than a year of earthquakes had affected their lives. Three staff members from the Blind Foundation were also interviewed in April 2011. The paper was co-authored by Dr Good and Dr Phibbs, along with Kerry Williamson, a research assistant from the Ministry of Justice.

Dr Phibbs says the research, a first of its kind in the world, highlighted the importance of communication and technology, personal and agency support, orientation and mobility, health, rebuilding independence, rehabilitation, coping and resilience.

“Participants demonstrated creative problem-solving abilities, resilience and community spirit. However our findings indicate that older visually impaired people are among the most vulnerable in disasters, and more work needs to be done to prepare them,” she says.

“I could hear crockery falling and breaking in the living room and in the kitchen and I thought ‘I don’t know what to do.’ I’ve been told many, many times during an earthquake go and stand under a door

jamb but I couldn't even get there." – Anonymous research participant.

**"This is the first time people with vision disabilities experiences of sequential earthquake activity has been tracked both before and after a catastrophic disaster anywhere in the world, and the results of our study provide a rare insight into the impact of disasters on those who are older and living with vision disabilities," Dr Phibbs says.**

**Dr Good, who spent nine years visually impaired before regaining her sight after 23 operations, says it is crucial people with vision disabilities keep transistor radios handy, with a good supply of batteries. "However, participants told us the quality of the information they received from radio broadcasts was poor. Misinformation and the challenge of finding the best radio station that could be relied on to have the most up-to-date facts was difficult.**

**"They felt accessing information that helped them, rather than frightened them was hard to come by in the aftermaths of the quakes. There was also a frustration at a lack of information about the conditions of local walkways and disruption to bus routes for many months following the quakes," Dr Good says.**

**"Oh the dog, the poor dog ... he was shivering, he shook until about 10 o'clock the next morning, he just shook. I gave him his breakfast and he couldn't eat all his breakfast, what he did eat, he brought up, so he was really in a bad way" – Bonnie, January 2011.**

**Guide dog users discovered that their companions had to be comforted, re-trained and assessed for their abilities to cope as working dogs after the quakes. "Altered bus routes, the disappearance of familiar landmarks, liquefaction and detours all created a greater level of stress for the people and their guide dogs," Dr Good says.**

**Seven people who were re-interviewed following the February 2011 quakes had learned about emergency preparedness through trial and error and they ultimately managed to cope and maintain their independence through four major earthquakes.**

**"They spoke about their resilience and having to survive what felt to them like a war zone. It was a matter of doing the best they could at**

the time with the resources they had. They all spoke of the need to be with others – the need to flee or escape their home to be in the company of friends and family was a regular theme,” Dr Good says.

All of the researchers concluded that more work needs to be done to prepare communities, agencies, families and individuals for potential disasters.

“Every participant told us that personal contact with someone in the week following the quakes was essential, but little agency support was offered,” Dr Phibbs says.

“People with minimal social supports reported feeling isolated and panic-stricken, while those with larger social networks reported a quicker recovery from trauma. It really emphasises the importance of neighbourhood and community support,” she says.

Research participants offered 17 suggestions for disaster preparedness for people with impairments and for the agencies that provide services to people with disabilities, including:

- Keep your shoes under your bed, keep a flashlight on the doorknob and have spare white canes available
- Store food, medications and water to last 72 hours for you and your dog
- Learn to communicate via text message and keep your mobile phone charged
- Have at least two people organised to contact you following a disaster
- Establish good relationships with neighbours and be willing to be a contact for others



## Programme and Events

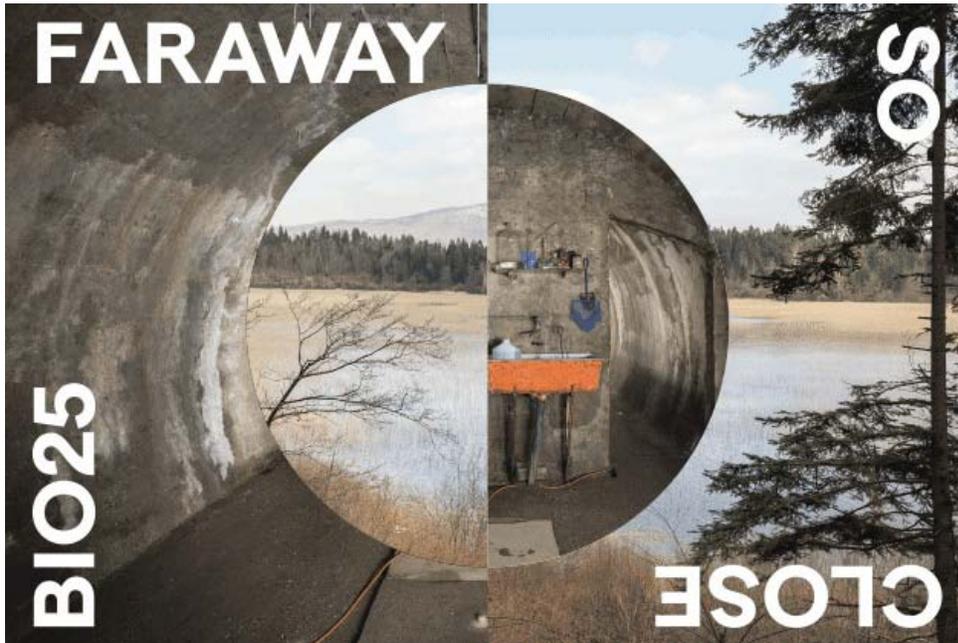


Photo: Delfino Sisto

Legnani. Graphic Design: Groupa Ee

### FARAWAY, SO CLOSE

25th Biennial of Design  
Ljubljana, Slovenia  
25. 5.–29. 10. 2017

The 25th edition of the Biennial of Design in Ljubljana is set to strengthen its role as an interdisciplinary collaborative platform where design is employed as a catalyst for change.

BIO 25, under the title *Faraway, So Close*, will be curated by Angela Rui, a Milan- and Rotterdam-based design critic and curator, and Maja Vardjan, curator of Museum of Architecture and Design (MAO).

In line with their focus on the humanistic side and expression of design, they will use the Biennial to decode through design the effects of environmental changes, asset migration, and reactions to the systemic crises.

In the face of the total failure of the theory of Positivism, we are now forced to confront the crucial and still largely hidden meaning of the consequences of "post-modernization", for which the city seems to have lost its authority as the territory where we look to find the source of quality existence.

Small changes are already taking place and gaining ground, and new inputs are slowly modifying our urban and rural environments. New frictions emerge out of the co-habitation of remote meanings and contemporary habits, as we look for new territories to signify, places to re-inhabit, ancient relations to re-enact, basic coexistences to re-imagine. Can this friction between distant conditions produce new scenarios for a different present time?

## Cork Centre for Architectural Education, Ireland

Along with the main subject-themes of the biennial, BIO 25 will de-centralize and will be interpreted as a shift towards new territories to be seduced by research and discourse, as well as by the idea of an event with which to produce knowledge. In the age of super information consumed in real time, the challenge of a biennial becomes increasingly closer to real conditions of everyday systems; to provoke and challenge the paradigms related to design and architecture through their pragmatic application, acting as a "permanent work in progress".

Slovenia, in accordance with its geographical conditions, will perform as a paradigm to stimulate, discuss and test the status of this global shift.

SAVE THE DATE FOR THE 25TH BIENNIAL OF DESIGN

Open Call 12 May - 5 July 2016  
Kick-off event 15 September 2016  
Process Autumn 2016 – Spring 2017  
Exhibition 25 May – 29 October 2017

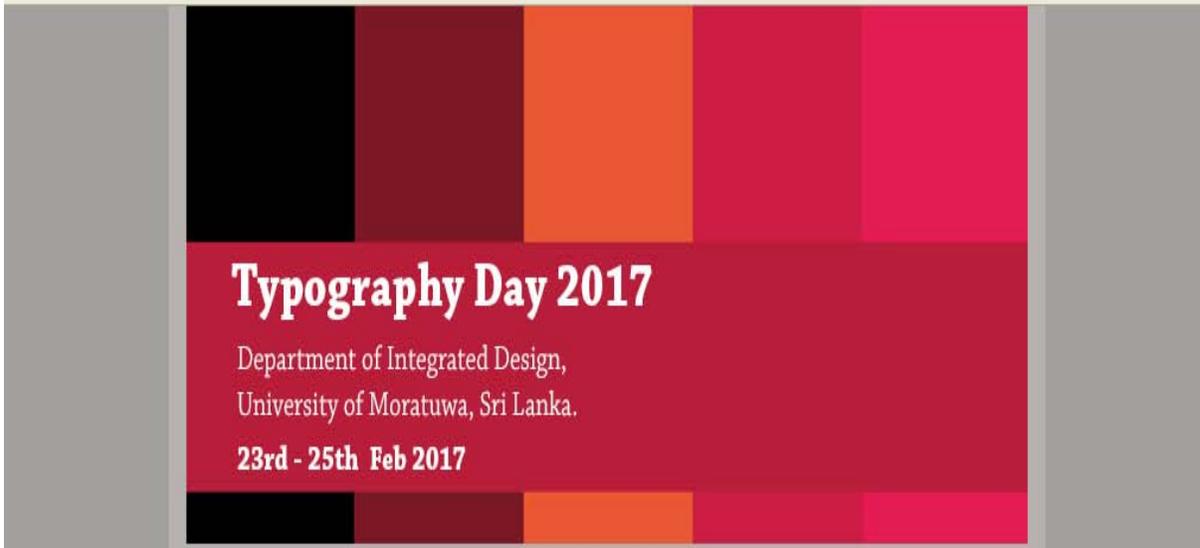
**FINISTERRA**  
**IV** ARRÁBIDA  
film art & tourism festival

**CONVITE**  
6 de Maio - quarta - 10 horas  
Fundação Portuguesa das Comunicações em Lisboa

Carlos Sargedas, diretor do Finisterra Arrábida Film Art & Tourism Festival, a Fundação Portuguesa das Comunicações, a Câmara Municipal de Sesimbra e Arrábida Film Commission tem o prazer de o convidar para estar presente na Sessão Inaugural da 4ª edição do Festival

organização

FUNDAÇÃO PORTUGUESA DAS COMUNICAÇÕES  
ARRÁBIDA FILM COMMISSION  
Câmara Municipal de Sesimbra



**DESIGN EXPERIENCE** is an initiative conceived by designers, made possible through designers and directed to designers.

We organize a **one-week intense seminar in Barcelona** where we explore the main concepts of Office Management, Project Management, Teamwork, Customer and Space Psychology, Creative Process, Sustainable and Ethic Design.

Important Barcelona designers will open the doors of their offices for us, will show us their construction sites and will tell us about the way they work.

We organize visits and round trips in the most important factories, showrooms, retails, places and sites in the area of Barcelona.

We discuss in a design environment about the most advanced topic about the design process







‘Reimagining Aesthetic Unfolding – From Conditioning to Awakening’



### **Future Architecture platform**

[Call for Ideas 2017](#)

**11/15/-1/9/2017**

Future Architecture call for ideas is open to all who wish to participate in the Future Architecture program cycle throughout Europe in 2017. The platform invites emerging creatives to apply with the ideas, visions and projects they consider important for the future of architecture. **Deadline is 9 January 2017!**

# INTERNATIONAL VISUAL METHODS CONFERENCE 5 VISUALISING THE CITY

**16 - 18 AUGUST 2017  
SINGAPORE**  
[WWW.VISUALMETHODS.INFO](http://WWW.VISUALMETHODS.INFO)

The phenomenon of cities is an increasingly important aspect of the everyday life of individuals. The United Nations reports that as of 2014, 54 percent of the world's population live in urban areas, with that proportion rising to 66 percent by 2050. Asia and Africa are projected to contribute the most to this growth. Cities come in, and are engaged with, on a variety of scales, shapes and interactions. From global cities to urban neighbourhoods to the bedrooms of our informants, from walking to sensing to mapping the city – the ways in which we have seen, experienced and documented cities are myriad.

In this 5th instalment of the International Visual Methods Conference, we seek papers, presentations and performances that critically examine the city through visual methods. However, we also welcome proposals for topics not directly related to urban life, but nonetheless encompass visual methods.

## CALL FOR PANELS, PAPERS AND OTHER CONTRIBUTIONS

Hosted in Singapore, itself a unique blend of city and state, we welcome presenters from a wide range of disciplines, from the arts to social sciences to STEM subjects – and particularly encourage interdisciplinary dialogues. Specific themes include, but are not limited to the following

- Critical Perspectives on Visual Methods
- Visual Methods for Urban Areas
- Walking, Sensing and Experiencing the City and other Spaces
- The Science and Technology of Visual Methods
- Mapping Everyday Life
- Visualising the Unseen
- Visual methods as an Agent of Change in the City
- Visual Methods in Teaching and Learning
- Open Stream

**SUBMIT ONLINE BY JAN 2017 AT**  
[WWW.VISUALMETHODS.INFO/CFP](http://WWW.VISUALMETHODS.INFO/CFP)

IVMC 5  
VISUALISING THE CITY  
16 - 18 AUGUST 2017  
SINGAPORE



22-26 MAY, 2017 | CANCUN, MEXICO  
**2017 GLOBAL PLATFORM**  
FOR DISASTER RISK REDUCTION

FROM COMMITMENT TO ACTION

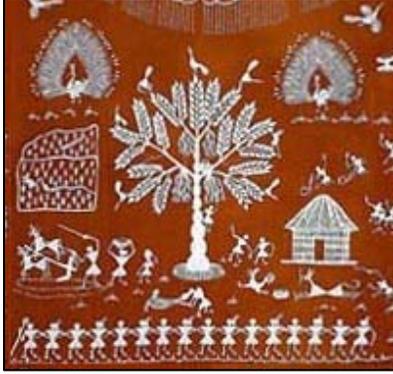
**Call for Papers - COINs17**  
**7th International Conference on Collaborative**  
**Innovation Networks**  
**“Resilience through COINs”**

COINs17 takes place September 14-17 in Detroit, Michigan.

This year's topic is "Resilience through COINs".

We invite you to submit your papers, posters, and proposals for workshops.





# Job Openings

## 1. Job Opening

CGI India ([www.cgi.com](http://www.cgi.com)) is looking for UX/Visual designers(2 position) @ Mumbai, Bangalore, Hyderabad location.

- looking for 3-7 yrs of experience in UX/visual design field
- Added advantage, if you can do both end-to-end UX/Visual design projects as a individual contributor.

If you are interested then send please share your resume + portfolio to pranavdatta [dot] natekar [at] cgi [dot] com

## 2. Job Opening

The World School of Design (soon to become WORLD UNIVERSITY OF DESIGN) invites applications and nominations for the position of Faculty/ Senior Faculty of the following schools.

FOUNDATION	
FASHION	Fashion Design;
COMMUNICATION	Graphic & Communication Design; Advertising & Media Design; Digital & New Media Design
MANAGEMENT	Design Strategy & Management; Fashion Business Management

Located in the culturally rich, design-centered national capital region of Delhi, and a part of the proposed World University of Design, WSD offers the largest portfolio of creative career options on a single campus, focusing on a cross-disciplinary approach for synergistic learning. Details at [www.worldschoolofdesign.in](http://www.worldschoolofdesign.in)

## **NOMINATIONS, APPLICATIONS, & INQUIRIES**

Nominations, expressions of interest, and applications (including a profile and link to portfolio) should be sent to this email id. All candidate information will be held in strict confidence.

### **3.Job Opening**

**Manager- Marketing Communications**

**Place- Mumbai**

**If communications is your forte, then we are looking for you!**

**Baaya Design is an emerging and unique brand with a retail store and design studio, focussed on Interior Styling & Bespoke Art Solutions. We curate high quality artisan products at our store, we customise for interiors and connect customers to our cultural roots that bind and shape us.**

**Qualifications: Degree/Diploma in mass communications/advertising/visual communications or relevant field. Must have excellent written English skills.**

**Experience: 3-4 years, understanding and knowledge of social media communications is a must.**

**JD: This is a key position, important to the long term goals of the organisation. WE need you to strategise, plan and manage brand communications in Baaya Design on:**

- **Social Media- FB, Twitter, Linked in**
- **New website content creation and ongoing updation**
- **PR feeding, content creation and supervise output**
- **In store events- conceptualise and implement.**

**Pls send your CV: [shibani@baayadesign.com](mailto:shibani@baayadesign.com), call- 022 65210165**

**Salary: Upto Rs. 6,50,000 PA (includes variable component), based on background of applicant**

### **4.Job Opening**

**Urgent requirement for UX Manager  
CGI India ([www.cgi.com](http://www.cgi.com)) is looking for UX Manager for Mumbai/Bangalore location.**

**If you are interested then send please share your resume + portfolio to [pranavdatta \[dot\] natekar \[at\] cgi \[dot\] com](mailto:pranavdatta.natekar@cgi.com)**

**Experience/Skill requirements**

- **12+ years of experience in UX domain with strong expertise in Strategizing,**

**Planning, Managing and Delivering multiple or large UX engagements, relationships and teams.**

- Demonstrated thought leadership and UX knowledge in the User Experience Design of software products and applications.
  - Expertise in full spectrum of Software User experience design process, techniques and methodologies.
  - Extensive Software UX Management experience in Estimating, Planning, Managing and Delivery of multiple or large UX projects and teams.
  - Strong and Considerable People management expertise and team mentoring activities.
  - Expertise in implementing various User research and analysis techniques including Ethnographic Research, Personas, user task-flows, and usage scenarios through goal oriented processes.
  - Experience in communicating and collaborating with senior management, product managers, designers and other stakeholder teams.
  - Demonstrated ability in UX focused participation in Software Requirement elicitation
  - Demonstrated capability in managing & developing User interface prototypes of varying Fidelity.
  - Experience in delivering User Experience for enterprise applications and visual design style guides, human interface guidelines, standards, patterns, templates and best practices as they apply to platforms.
  - Experience in planning and knowledge of conducting User experience Heuristics Evaluation, User Testing, Analysis and Troubleshooting.
  - Excellent communication, presentation and organizational skills, with attention to detail.
  - An extensive work portfolio with demonstrated examples of designing great user-centered experiences for both enterprise and consumer applications is a must Analytical/Decision making responsibilities.
  - Enable team collaboration working with cross-functional teams - demonstrated by working effectively in multi-location /distributed teams building products and applications.
  - Partnering, collaboration and influencing across service lines and functions, different cultures and complex time zones including virtual working with teams
  - Good communication and people skills in working in a multi-disciplinary, collaborative environment
- Education & Technical certification**
- Master's or Bachelor's degree / Diploma in Human Computer Interaction, Industrial Design, Visual Communication, Graphic Design, Interaction Design, Architecture or Fine Arts or similar
  - Certified UX HCD professional
  - CUA/ CXA Certification from HFI or similar UX certifications would be an added advantage.

If you are interested then send please share your resume + portfolio to pranavdatta [dot] natekar [at] cgi [dot] com

## **5. Job Opening**

**We are looking for a company who will create the stunning UI and standardise our Pharmaceutical Machine's GUI.**

**About ACG Worldwide**

ACG worldwide is a global pioneer in innovative processing, manufacturing and packaging solutions for pharmaceutical and nutraceutical industries. With over 5 decades of enriched experience, ACG serves customers in more than 100 countries. The group comprises 13 customer-centric companies that offer comprehensive solutions such as empty hard capsules, packaging films, capsule filling machines, softgel encapsulation lines, tablet presses, tablet tooling, tablet coaters, blister packing & cartoning machines, vision inspection systems, and serialization/track & trace solutions. A state-of-the-art R&D facility, 'SciTech Centre' in Mumbai, stands testimony to continuous investment in innovative products & technologies.

<http://www.acg-world.com>

Please write me at [Shailendra.Bochkari@acg-world.com](mailto:Shailendra.Bochkari@acg-world.com) or call me at +91.9820.139.319.

## **6. Job Opening**

hCentive looking for creative minds who see glass half full rather than half empty .Out of the box thinker who is ready to challenge the status quo .

**Experience: 3-6 years**

**Role: Visual Designer**

**Location: Noida**

- Proficiency in Usability Analytics
- Exposure to Mobile website development.
- Expertise in designing tools like Dreamweaver, Illustrator, Flash, Photoshop etc.
- Basic knowledge of JavaScript is highly desirable.

Do write back at [sahil.jain@hcentive.com](mailto:sahil.jain@hcentive.com) if you fit the bill or feel free to call me on 9891800419 and we can discuss this opportunity.



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**The views expressed in the signed articles do not necessarily reflect the official views of the Design for All Institute of India.**

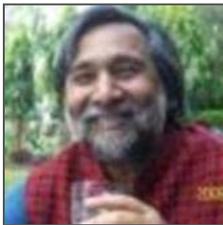
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