Dear all,

A few thoughts this week on innovative ideas and seminal research, inspired by Zaha Hadid and Ronald Coase.

Earlier this week I was at a high table dinner at one of our new colleges, invited by the master (Dean of Medicine). In the interaction after the meal three first year undergraduates cornered me: one of our own from BAAS, an economist and a student of English literature (no, this isn’t developing into joke — for those who are familiar with the Irishman, Englishman and Scotsman formulation). They wanted to know what inspired my career path and I made reference to various seminal intellectual ideas that inspired me to pursue the quest for knowledge in a more committed and focused way (Friedrich von Hayek, Christopher Alexander, Karl Popper etc) and quickly got on to the essay that Professor Coase first drafted as an undergraduate at LSE, which later was cited in his Nobel prize nomination and award. I challenged them to look for gaps in knowledge in their respective fields, even as first year undergraduates. My advice was to find an issue that has significance among expert specialists and lay public alike and read seminal papers on the issue written from several disciplinary perspectives. Then I told them to make an appointment to see me in October to report on their progress. They were totally captivated by the idea of an undergraduate essay creating a paradigm shift.

This week I spent an hour or so in Macau listening to a rather poorly (with flu) Dame Hadid talking about the evolution of her design genre over 20 years. I was confirmed in my appreciation of her projects and came away convinced that she does, in fact, represent a genuine paradigm shift in architectural design. Like Antoni Gaudi, but more significant because Hadid’s curves are structural and mainstream not decorative and fringe. Two thoughts came to mind as I listened to Zaha describe the emergence of an idea, from her Vitra fire station to the complex work she opened in Seoul last week.

First, it seems to me that her natural shapes are analogues, not homologues. They are inspired by nature but are designed as finished shapes. Geometric algorithms are used to fit 3D curves that create spaces and profiles that are abstracted caverns, river-valleys, cliff-faces, carvings, pinnacles and hills. But they are designed not grown. She would no doubt challenge this interpretation by citing preliminary studies in a project that play with alignment, angles, tessellation and so on. But it is, I assume, the designer, who governs the process of form-evolution, using a complex mix of criteria and rules that combine functional, programmatic, materials, engineering, cost and aesthetic constraints.

Second, I found myself wondering what scope there is in architecture for an approach to designing natural forms, where buildings are grown using processes that are analogous to those that created the
natural forms being imitated. So – analogue processes not analogue forms; with analogue processes giving rise to homologue building forms (sharing a similar ‘process root’ with the natural form being imitated). What might those processes look like? Two come to mind: Growth versus decay. Put other ways: addition versus subtraction; extension versus erosion; accretion versus attrition; shape genotype versus shaping genotype (see below).

**Extension** is the process by which living forms grow. A mollusc’s shell growing an extra ridge along its leading edge in every growth period eventually creating a geometrically perfect spiral that can be described by a Fibonacci mathematical function and following the golden rule of proportionality copied by Greek architects. The dendritic beauty of a tree is achieved by simple rules of division: sequencing, spacing and angularity plus even simpler rules of radial growth.

**Erosion** is more complex as a shaper of natural form. Understanding it is the domain of geography and geology rather than biology. Interestingly, the shapes that Hadid’s style of architecture emulates are formed by erosion in nature, not by extension. They are dying forms not growing forms. They are being reshaped by destructive natural forces rather than shaped anew by creative forces.

Geo-morphology is created by environmental systems-effects whereas bio-morphology is created by micro-cellular systems effects.

The dendritic, sinusoidal, radial and tessellation geometry of shells, trees and leaves are the phenotypes associated with growth process genotypes. Hills, valleys and caverns are shapes created by various forms of natural sculpting processes; by analogy, they are the phenotypes produced by erosion process genotypes. What happens when we design by the latter rather than the former?

Arising from this analysis is a potentially new thought. Most generative design experimentation to my limited knowledge follow an extension approach. Forms are built from primitive shapes and/or simple rules. Listening to Zaha, I found myself wondering what forms, efficiencies, inefficiencies and surprises might emerge from erosion-type generative designs. Or perhaps we could call it destructive design.

Some kinds of fabrication techniques, such as sculpture, work in this way. Or an automated fabrication technique that starts from a block and removes material to form the desired shape. But what if the shape-modelling process itself, not just the fabrication, worked from the block to the shape. What if design was a process of taking away rather than adding, creating voids rather than adding structures?

I am sure that there must be published accounts of such experimentation, but I have not come across them. Colleagues more familiar with the field than I can enlighten me perhaps. But in the light of the opening thoughts of this Roundup - potentially seminal ideas arising from the novice and immature observations and questions of an undergraduate – I offer the challenge to those more expert than I, or otherwise intrigued: find out what has been written on ‘parametric architectural design by ‘creative destruction’ and try writing a seminal paper to develop the idea. Perhaps we could birth a new approach to experimental computational design in HKU: genotyped geomorphological architecture (GGA). As distinct from Hadid’s direct analogue design of phenotype forms. We could start with a paper that reviews and compares three approaches to nature-inspired curvilinear architecture design: phenotype design (Hadid); genotype creative (traditional emergent design algorithms – no-doubt also used by Hadid); and genotype destructive (potentially and theoretically the more powerful way of exploring design solution space in the domain of natural shapes).

A few thoughts on what a general design algorithm might look like: Start with a 3D block dimensioned according to site, program, extrinsic design and planning constraints; seed the spaces required, defined as voids with various connectivity constraints, with the number of destination and connection voids being a parametric constraint; chose an erosion technique (wind, water, tectonics, catastrophic, gradual, particulate creep under gravity, freeze-thaw etc). Apply to shape the building
form, with constraints on wall thickness etc. Iterate multiple times to explore alternative configurations, with the ability to lock in accepted elements of the ‘destructive design’.

The results will look something like Hadid’s but will be truly generative and innovatively designed by simulated natural processes that are more appropriate to the desired forms than are the more typical computational processes used in developing analogue forms.

And if this leads to innovations in architectural scale design, why not in landscape and urban design also?

Congratulations and thanks to all those mentioned below for their contributions to the Faculty’s research and engagement agenda. Especially to Wilson for his 7M HKD grant. Size does not always matter but it helps us strategically in the faculty and is also an effective way of buying in researchers and developing stronger cross-cutting knowledge and applications.

Also special congratulations to Hoyin for his successful application for tenure and promotion to Associate Professor!

Chris
Faculty of Architecture

The University’s Policy Board of Postgraduate Education has informed the Faculty that under the “Central Pool Research Postgraduate Places for Rewarding Internationalization 2014-15” scheme, one Type A place has been allocated to the Faculty.

Apart from the above, one Type B place has been allocated to the Faculty for the following project:

<table>
<thead>
<tr>
<th>Title</th>
<th>Improvement of Outdoor Activities and Occupant Comfort Through Urban Design</th>
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</thead>
<tbody>
<tr>
<td>Supervisor</td>
<td>Dr. Jianxiang Huang</td>
</tr>
<tr>
<td>Department</td>
<td>Urban Planning and Design</td>
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</tbody>
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Architectural Conservation Programme

1. Dr. Hoyin Lee, Professor Lynne DiStefano and Ms. Katie Cummer

- involved in a joint-field study for the students of University of Pennsylvania’s Master of Science in Historic Preservation programme, from 8 to 15 March 2014.

- participated (by invitation) in the filming of the documentary, City of Imagination: Kowloon Walled City, 20 Years Later, by the Wall Street Journal, premiere screening at the Hong Kong Convention and Exhibition Centre on 25 March 2014.

- launched and facilitated the Distinguished Public Lecture Series: Four PhDs on Community and Arts/History/Heritage, organized by Arts in Heritage Research (AHR) and co-organized by ACP, The Hong Kong Institute of Architectural Conservationists (HKICON) and The Fringe Club. This public lecture series consists of lectures by four distinguished experts in arts, history and heritage of Hong Kong; Dr Victor Lai (Associate Director, Academy of Visual Arts, Hong Kong Baptist University); Dr Lau Chi-pang (Director, Hong Kong Local Records Office, Lingnan University); Dr Joseph Ting (former Director, Hong Kong Museum of History); and Dr Hoyin Lee (ACP Director, The University of Hong Kong); held at Fringe Dairy, The Fringe Club, on 22 March, 29 March, 26 April and 3 May 2014. URL: http://ahr.org.hk/en/my-product/distinguished-public-lecture-series-four-phds-on-community-and-arts-history-heritage/.

2. Professor Lynne DiStefano

- appointed by ICOMOS as a Mission Expert for the joint UNESCO-WHC / ICOMOS / ICCROM Reactive Monitoring Mission to Wudang Mountain, Hubei Province, China. This was a five-day mission, from 9 to 13 March 2014, to assess conditions that could affect the inscribed World Heritage status of “Ancient Building Complex in the Wudang Mountains.” The mission was jointly organized by three inter-governmental organizations: United Nations Educational, Scientific and Cultural Organization (UNESCO), World Heritage Centre (WHC), the International Council On Monuments and Sites (ICOMOS) and the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM).

3. Dr. Hoyin Lee and Ms. Katie Cummer

- led a joint field study and workshop in the World Heritage Site of West Lake and associated areas in Hangzhou from 10 to 14 March 2014. This joint teaching activity was conducted between HKU-ACP’s Year-2 BA(Conservation) students and Zhejiang University of
Technology’s (ZJUT) Year-3 BAch students. Dr. Lee was also invited to deliver two lectures for over 100 students at ZJUT’s Department of Architecture.

Department of Architecture

1. Mr. Yan Gao and Mr. Ashley Scott Kelly of Division of Landscape Architecture

- have been invited to the 2014 SmartGeometry Workshop cluster proposal review committee. SmartGeometry was formed in 2001 as a partnership between Practice, Research and Academia. Many of the world’s leading architectural and engineering practices (Foster + Partners, Woods Bagot, AECOM, PLP, Buro Happold) and educational institutions (Architectural Association, MIT, Delft Technical University, University of Bath) are represented in its core organization. The Smartgeometry community is built upon annual workshops and in international conference. To date, Smartgeometry has hosted numerous workshops around the world. Over 1000 people from organizations all around the world have participated in Smartgeometry workshops. Smartgeometry is a constantly regenerating community full of fresh cutting edge ideas and energy.

- The main Smartgeometry yearly event is made up of a 4 day workshop and a 2 day conference. It offers attendees the chance to measure themselves against, collaborate with, and learn from the best in academia and leading professional practices worldwide across architecture and engineering. Each year, the organization puts forth a challenge to guide the direction of the Workshops and frame the discussion for the conference days. In past years, these challenges have covered the topics of Environment, Analysis, Form and Structure. The most recent set of events in London, Barcelona, Copenhagen and Troy, NY focused on Fabrication (Working Prototypes), Data (Building the Invisible), Materials (Material Intensities) and the larger issues of Computational Uncertainty (Constructing for Uncertainty).

- This year SmartGeometry will be at the CUHK from 14-19 July 2014, in partnership with HKU. The challenge theme of this year is Urban Compaction. The workshop and conference will be gathering of the global community of innovators and pioneers in the fields of architecture, design and engineering. (smartgeometry.org)
2. Mr. Tao Zhu

- A Critical History of Contemporary Architecture 1960-2010, for which Tao Zhu contributed one chapter, has been published by Ashgate Publishers, London in March 2013. Bringing together 20 leading international experts in the field, the book provides a comprehensive, critical overview of the developments in world architecture during the past five decades. As one of the 20 contributors invited by editor, Tao Zhu wrote the chapter “Architecture in China in the Reform Era: 1978-2010,” the first critical survey of this subject in English.

3. Tom Verebes

- his MArch studio collaborated in a joint workshop with Prof. Takashi Yamaguchi at Osaka Songyo University; and also had participated in a joint studio review on a shared studio project with Jesse Reiser/Nanako Umemoto’s studio from Princeton University, Nagoya Institute of Technology, together with Obuchi Lab, who hosted the event at The University of Tokyo.

- delivered two lectures, at Osaka Songyo University, and at Tokyo University, titled, "Urbanity and the Indeterminacies of its Formation".
Division of Landscape Architecture

1. Scott Jennings Melbourne and Melissa Cate Christ

- led a six-day overseas study tour to Yangon, Myanmar (Burma) with first year MLA students as part of their studio being taught together with Ivan Valin. Students toured the historic city center, investigated waterfront project sites, met with local professionals and officials in addition to presenting initial research findings at Yangon Technological University. More continues to be shared through the course website [studioyagon.com](http://studioyagon.com).
1. Dr. Wilson Lu

- with a group of PIs from multiple faculties, Wilson won an ITF Tier 1 research project “RFID-Enabled Building Information Modeling (BIM) Platform for Prefabrication Housing Production in Hong Kong”. A project sum of HK$7,365,020 has been approved. The project will be integrated within the aspirations of the HKUrban iLab.

- gave a short talk “PPP in mega infrastructure projects: perspectives from Mainland China” to a group of 6 Dutch project managers on 14th March 2014. The project managers from different Dutch infrastructure and construction projects were assembled on a central location in Amsterdam city to participate a 24-hour online event “King/RPA 24 hours”, to find out solutions for ‘intergovernmental cooperation in projects’ by searching expertise around the world using online tools like Twitter and LinkedIn.

- published the following paper


- led the following groups of year 2 (3-year curriculum) BSc(Surveying) students to the finals of the CIOB Global Student Challenge (GSC) after seven rounds of tough competition over the past months:

“Quad” (Hester Wang, Horace Tse, Isaac Wong, and Iverson Chan)
“Square” (Jasmine Chan, Rufina Cheng, Michael Choi, and Jonathan Leung)

- The GSC initiative, which was announced in October 2013 by the CIOB, aims to help identify and mold the construction leaders of tomorrow. More than twenty teams from universities in Australia, Hong Kong, China, the UK and the US have signed up for the challenge and the top six best-performing teams during the competition will compete in the Grand Final. The teams were formed by no more than 4 members acting as financial manager, overhead manager, procurement manager, and construction manager to conduct a construction business game based on the MERIT (Management Enterprise Risk Innovation and Teamwork). After each round, the system will calculate the score of each team. Quad and Square entered the finals by ranking as No. 1 and No. 5 respectively.

- With the strong support of the HoD, Prof. K.W. Chau, the Grand Final will be held at the University of Hong Kong. The teams will play a further eight rounds competing against each other during 24 – 25 July 2014.

2. Dr. S W POON

- The joint paper “Meeting sustainability challenges of mega-event flagships” published in Engineering, Construction and Architectural Management has been selected by the Journal’s Editorial Team as a Highly Commended Paper of 2013.

- Dr. Y. Deng, the co-author, was my PhD student graduating in 2011 and is currently an Adjunct Assistant Professor of the Department.
3. Professor Steve Rowlinson

- visited Professor Stuart Green, head of school, at Reading University in March 18, 2014 to discuss research collaboration.

- visited Dean Tony Thorpe, faculty of engineering at Loughborough University on March 20, 2014 and discussed research collaboration with Prof Thorpe and his colleagues.

- was invited to visit the Australian embassy construction site in Jakarta and advise on Occupational Health & Safety issues on the site and other sites within Indonesia at the request of a Hong Kong contractor.

- invited Dr Adrian Bridge of QUT, Australia to present their joint research in the field of "FDI into Australia in infrastructure construction" on March 27th 2014 in the Faculty.

4. Sr. Bay Wong

- attended a board meeting of the Antiquities Advisory Board on 4 March 2014

- attended a Policy and Research committee Task Force meetings of the Hong Kong Green Building Council (HKGBC) on 21 March 2014

- attended a Director's meeting of the HKGBC on 24 March 2014

- appointed by the Secretary for Development as a member of the Advisory Committee on Water Resources and Quality Water Supplies for two years from 1 April 2014 to 31 March 2016

- will attend a Scholarship presentation ceremony of the HKIS on 28 March 2014

- will make a presentation to the "Service Procurement" seminar organized by The Institute of Purchasing & Supply of Hong Kong on 29 March 2014. The topic is "Service Procurement and Services Contract Management/Monitoring".
1. Mr. Kishan Datta Bhatta (full-time PhD student) & Dr. Roger C.K. Chan

   - Mr. Kishan Datta Bhatta along with Dr. Chan presented a paper entitled “Ecotourism and Sustainable Community Development: A Critical Examination of Tourism Impacts on the Environment and Local Communities in the Sagarmatha National Park, Nepal” at Himalayan Studies Conference 3 at Yale University, held 14–16 March 2014.

2. Dr. Roger Chan

   - Dr. Chan’s report on the Common Core Teaching Development Grants (TDG) for the course “Sustainable Urban Development and Hong Kong” had been externally reviewed. The reviewer commented that “The outcome of the project is very satisfactory, which has achieved all objectives successfully. The booklet produced as a capstone for the course is very impressive, and it would be wonderful to see it distributed more widely.” The reviewer also thought there is nothing quite like seeing students work in print – as a professionally produced and finished publication, and regarded this a wonderful achievement for the students in the course.

   - Dr. Chan awarded a Post-doctoral Fellow in Contemporary China Studies (jointly with Professor George Lin, Associate Dean, Social Sciences, PI) in “Land Development in China’s Metropolises” by the University Research Committee. Applications for the position close on 30 April 2014.

3. Professor Rebecca L.H. Chiu

   - invited to serve as a member of the Expert Panel of the Stage 2 Community Engagement of the Planning and Engagement Study on Future Land Use, Ex-Lamma Quarry Area at Sok Kwu Wan, Lamma Island – Feasibility Study, 14 March 2014 to 13 May 2014.

4. Ms. Pui Si Natalie Hon (part-time PhD student)

   - Ms. Pui Si Natalie Hon, under the supervision of Dr. Roger Chan, was appointed as member of the newly formed Urban Planning Committee of Macau SAR on 19 March 2014. The Urban Planning Committee was established under the new Urban Planning Law, which took effect on 1 March 2014.

5. Dr. Mandy Lau


6. Professor Anthony G. O. Yeh

   - has a new magazine publication, “The Insights of Hong Kong’s Development Experience on China’s Urban Development”, Hong Kong and Macau Affairs (紫荊論壇), March–April 2014, Issue 14, pp. 18–24.
7. Dean Webster

- British Government Cabinet Member Francis Maud MP, applauds Dean Webster's sDNA urban configurational analysis tool developed at Cardiff University (sDNA=spatial Design Network Analysis, initially developed in Cardiff University Sustainable Places Institute under the Dean's leadership, with a plan to develop it further as a 3D urban design analysis tool at HKU):

"It is great to see the fascinating work that Cardiff University is doing to create efficient cities that best serve their communities... Efficiency is at the heart of this government's long-term economic plan. But we want to do more, including releasing more surplus (town centre) properties that could be put to better use. I'm interested in how analysis from initiatives like Cardiff University's sDNA tool could help my officials examine how our plans will shape the local environment in the future."

Francis Maud MP


- submitted the HKU work-package of a multi-partner, multi-million Euro EU research funding bid to look at interconnectivity in global housing markets. The project involves various partners including UCL (CASA) and Universite Paris I (Sorbonne-Parthenon) and is led Renaud le Goix, a co-author with the Dean on several urbanism papers.

- has been invited as a juror on the HK Green Building Awards (GBA) panel.