URBAN UPDATE

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Urban Projects

Participated in Mansour Esnaashary Esfahani's PhD comprehensive exam on "Methodology for improving the success probability of adaptive reuse projects through pre-project planning." Mansour is supervised by Dr. Carl Haas, and also serving on on his committee are Dr. Hipel and Dr. Bachmann.

Engineering Education

Met with Ajoy Opal, Associate Dean Teaching on July 4, to discuss teaching experiences, and goals, and receive information on teaching development opportunities.

Teaching

Capstone projects wrapped up with a total of 28 design projects supported by technical advisors from CEE faculty and industry representatives. Final project reports and presentations have all taken place - all with great technical expertise, rigorous design process and evident excitement.

MTE Pitch Competition

On July 30th, six teams competed in the Pitch Competition sponsored by MTE. In third place ($400), team Unlimited Disruption Limited (above); in second place ($1,100), team STATION (below), and in first place ($3,000), team upCYCLE (next page). The judging team included members of MTE and faculty.

Event Highlights

Centre for Teaching Excellence » Support for.... » Research and grants »

Learning Innovation and Teaching Enhancement (LITE) Grants

SUSTAINABILITY

PRESIDENT'S ADVISORY COUNCIL ON ENV SUSTAINABILITY

CIVIL AND ENVIRONMENTAL ENGINEERING MENTAL WELLNESS WEEK

CE2GA MENTAL WELLNESS WEEK SHARING CIRCLE

ENVIRONMENT

Environment » Graduate » Research Clusters »

Industrial Ecology

SEED JOINED THE INDUSTRIAL ECOLOGY GROUP

LITE Grants. Notification of award of the LITE Grant to run Urban Design Days in Winter 2020.

Turkstra Advisory Board "Meet and Greet". Westmount Golf and Country Club. July 15.

CEE Graduate Studies Committee (GSC). Joined and participated on July 11, in the GSC led by Rob Gracie.

PACES 1st Meeting. Participated in the 1st meeting on July 23 as a faculty representative for a two-year term, July 2019 - April 2021.

Mental Wellness. Led the mental wellness sharing circle with Zoe Tipper and Michelle Liu. July 24.

Keep an eye out next month for...

Here are events to look forward to in August 2019:

- CIVxTalks for CE2GA, Aug 1
- Bio-economy seminar by Lorie Hamelin (Toulouse) @SEED Aug 6
- NICKEL 2019 Conference, Aug 20-21

CIVE400 Civil Engineering Design Project

As an instructor for the Civil Engineering fourth year design project, I have been on the teaching side of design, but also learning how students learn and iterate their designs, and how they collaborate together. The capstone design experience exposes students to all stages of the engineering design process, and is intended to provide a culminating and significant design experience for the students. Students choose a challenging design problem to address, where an important focus of this capstone design project is innovation that goes beyond standard industry practice, and where sustainability considerations must be central to the proposed designs.

We cannot solve our problems with the same thinking we used when we created them - Albert Einstein.

Faculty Contribution

Chris Bachmann is an Assistant Professor in the Department of Civil and Environmental Engineering at the University of Waterloo. His primary interests include studying the interaction between transportation systems, economies, and trade flows. His research group employs methods from both engineering and economics including: Computable General Equilibrium models, Input-Output analysis, Life Cycle Assessment, Cost-Benefit Analysis, Random Utility Models, travel demand modeling, microscopic traffic simulation, and optimization. In 2017, he received TRB's Fred Burggraf Award for excellence in transportation research by researchers 35 years of age or younger, for his sole-authored paper, "Modeling the Impacts of Free Trade Agreements on Domestic Transportation Gateways, Corridors, and Ports." He is a member of the TRB's Standing Committee on International Trade and Transportation (AT020).

Dr. Bachmann's research program focuses on transportation and economics. Broad research interests include the interaction between transportation and economics, trade, energy, transportation network resiliency/criticality/robustness/ vulnerability, risk, dangerous goods movement, transport economics, and transport project and policy evaluation. Recently, he has been studying the Spatial Economic and Transport Interaction (SETI) process in the context of globalization. In an increasingly globalized world, there is a need to understand two main questions:
1) what new demands from economic activities tied to global networks will be placed on Canada's transportation infrastructure; and
2) what investments will maximize the capacity, reliability, and resiliency of the Canadian transportation network to enhance the vitality of Canada's economy.

Tackling these interdisciplinary problems requires a breadth of methodological approaches, where his research group has worked with various agencies including Transport Canada, the Ministry of Transportation of Ontario (MTO), the Region of Waterloo, Innovation Science and Economic Development (ISED) Canada, and the National Science and Engineering Research Council of Canada (NSERC). His current NSERC Discovery Grant focuses on "Optimizing Canada's Transportation System for Global Competitiveness."

Student Contribution

Tina Pham, Shuxian Nian, Hana Bregman and Daeun Yoon are a group of sustainability-conscious individuals excited to develop new ideas to promote circular economy. They are also the first place winners of the MTE Pitch competition. Conversations with their technical advisor Dr. Carl Haas have sparked their interest in the adaptive re-use of materials. After Dr. Haas shared with them stories about projects such as re-use of skis to build structures in Switzerland, the team decided to look for other materials that have inherent structural properties. Since bicycle frames are made out of metal and are designed to withstand loads (the weight of the rider), the team saw a lot of untapped potential in the use of bike frames in structural applications. Team upCYCLE is working to design a modular building block composed of bicycle frames that can be used in small structural applications. The next phase will bring forth a fully designed and analyzed modular unit made of bicycle frames, built to withstand a specified structural load.

Over the last two decades there has been growth in global recognition of the benefits associated with cycling. Cycling has become increasingly relevant to city policy makers and transportation planners, with the major tenant of support being the movement towards sustainability. The widespread adoption of the bicycle culture offers advantages to the environment through reducing automobile reliance and promoting affordable and active transportation (SpiCycles, 2009). While it is evident that the useful life of a bicycle provides sustainable benefits, what is often overlooked is the waste produced at the end of its life. The rapid expansion of bicycle production and consumption has resulted in a large amount of bicycle waste generation, infringing on landfills that are reaching maximum capacity. Existing measures to divert bicycle waste from landfills include recycling and reusing; however, current efforts do not contribute to significant waste reduction. There is a high potential for upcycling bicycle frames in an industry that is a dominant user of metal for structural purposes like construction. The construction industry is currently in pursuit of sustainable measures such as adaptive re-use and the utilization of recycled materials. The design objectives identified for the modular unit includes maximization of structural competency, minimization of non-bicycle frame materials, maximization of different types of bicycle frames, minimization of construction and fabrication time and cost, and aesthetic appeal. The repetitive nature of the modular unit allows the structure to be implemented for various applications, thus maximizing the utilization of bike waste. The building blocks are designed to be versatile and can be used mostly for small structures that are exposed to low live and dead loads. Examples include bus shelters, storage facilities, canopies, and temporary enclosures.