



SOE Connect

SoE Connect Presentations

P2

Social Network Analysis
and the Engineer

P3

2018 Winegard Lecture:
Chris Turner

P4

ENGINEERING Research



Mary Wells

Dean, College of Engineering and
Physical Sciences

A message from the Dean:

The School of Engineering (SOE) at the University of Guelph is on a mission to achieve "Sustainability Through Innovation." This means that all SOE faculty members are striving to have a lasting positive impact on the world through their research—not only to improve our lives now, but also to improve the lives of future generations. I believe that the greatest innovations happen when researchers cross the invisible barriers that divide them, enabling the integration of diverse expertise, backgrounds, and state-of-the-art methods and equipment. These barriers include academic units, government departments, companies and sectors. In our current knowledge economy, an economy dependent on the accessibility of information, it is often the case that the knowledge required to solve a problem is in a different place than the problem itself. Thus,

cross-disciplinary collaboration is an essential tool that enables us to innovate and solve some of the most complex problems of our generation. SOE Connect, a program established by SOE Professor Wael Ahmed, creates an environment that brings together people with different knowledge and skills. This initiative facilitates conversations between groups of people who would not normally have the opportunity to interact; it is a catalyst for sparking new collaborations, and thus new innovations. Communities are created by people and the relationships that they form with each other. SOE Connect is a prime example of how we can bring together people with different perspectives to build diverse research communities. This diversity of thought will enable us to tackle research problems that are too big for the individual. It will fuel the creation and application of new knowledge that improves our lives today, and continues to improve our lives tomorrow.



“ Regardless of our professional background or our occupation, every one of us is an artist and an engineer, by the nature of the human experience. Let us connect to enrich our creativity and problem solving skills because these are characteristics that make us human ” - Wael Ahmed

The first SoE Connect event was designed to bring together faculty from across campus to explore research collaborative opportunities in Sustainable Food Engineering. Four faculty from Food Sciences presented their research activities including Don Mercer, Shai Barbut, Loong-Tak Lim and Alejandro G. Marangoni. Dr. Marangoni consider the SOE-connect to be a great opportunity for faculty members in the Department of Food Science meet colleagues in the School of Engineering. He added “Historically, Food Science did have ties with the engineering faculty, but those had not been very active in the last 10 years. This event was a positive first step towards closer collaboration between faculty in both departments. The synergies were immediately obvious, combining the quantitative engineering approach to help address scientific and technological problems facing the food industry. Personally, I already have active collaborations with Mario Martinez and Erica Pensini and look forward to new collaborations with Mostafa Elsharqawy, Ashutosh Singh and many others. The possibilities are endless to expand our knowledge of food materials and their application. Let’s keep the ball rolling and raise the bar of our research excellence.”



CBaSE Director Melanie Lang explained how CBaSE can enable collaboration through the campus in order to create interdisciplinary teams who can address real world businesses of all sizes across all sectors to solve industry issues. She also introduced the Co-operators Centre for Business and Social Entrepreneurship (CBaSE) recently launched the Hub Incubator Program and explained how SOE can benefit from its great resources for budding entrepreneurs to grow their business ideas.



Yes you read correctly – the words “social” and “engineer” were used in the same sentence. But have you ever wonder how you are connected to a broader social community? The idea is not new and social network analyses have been in use since the early 20th century. What is perhaps new is using social network analysis to determine relationships within an engineering research program. And while engineers are stereotyped as non-social, the theory can still be applied to determine the interconnectedness of research themes within a subset of the engineering field, which in this case was the Environmental Engineering and Water Resources Engineering groups. The methodology is quite simple. Each faculty provides a three-minute high level presentation of their research to the entire group in a dedicated meeting. At the end of the presentations, the faculty are then asked to develop a mind map of how their research can connect with the research of a least three others. This data is then imported into a social network analysis software (Gephi - available for free at gephi.org) where the software is used to identify communities and connections (see the figure below). While most researchers could have readily identify other researchers working on similar research themes, what the social network analysis provides is the ability to identify communities and the interface between communities. So where does this lead? Social network graphs provide a road map of how research in one apparently separate area might be connected to other areas. As large scale grants and contracts are increasingly requiring a multidisciplinary team to solve the issues, the maps can help identify research themes and faculty that need to be included in the proposal to ensure success and add value to the research. In addition, through Connect events, the subset

“



Moreover, Dr. David Hobson, Manager Technology Transfer & Entrepreneurship at the Research Innovation Office (formerly the Catalyst Centre) describes how the Research Innovation Office now supports faculty under four main pillars: Technology Transfer (licensing inventions to companies); Industry Liaison (connecting companies to faculty to

enable sponsored research); Knowledge Mobilization (bringing practical useful research results to end users); and New Venture Creation (helping faculty create startup companies to bring products based on their research to the world). Dr. Hobson opined, "this is great move by the School of Engineering to align their skills with other departments like Food Science and Plant Agriculture to solve the wicked problems of the world facing everything to do with sustainable production, processing and packaging of Food." The Research Innovation Office will also be helping the School of Engineering with the administration of the Barrett Foundation research grants.

The increasing global population, depleting water, land resources and climate change have made our food system extremely vulnerable. For centuries, food engineers have provided various solutions and technological interventions that allow for sustainable management of our dynamic food system. But, to sustain this engineers require understanding of the science behind the food. Currently the food research lab is working on various multidisciplinary projects and SOE-Connect provides the much-needed platform to share and collaborate.



Winegard Lecture IN ENGINEERING

On Wednesday March 21st the School of Engineering hosted the annual Winegard Lecture. This year's lecturer was Chris Turner. Chris is an author, speaker and strategist, providing Canada's authoritative voice on sustainability and the global cleantech boom. His reporting on energy, climate and sustainability issues appears regularly in The Walrus, The Globe & Mail, Canadian Geographic and many other publications. Mr. Turner's presentation, Tracking the Global Energy Transition, was informative, thought provoking and entertaining while featuring many real world examples of where clean, sustainable energy is being successfully integrated into our day to day lives. The lecture was well attended with many SoE faculty and staff on hand. Also in the audience was Dr. William Winegard, the lecture's benefactor, and members of his immediate family. The School of Engineering looks forward to hosting the Winegard Lecture again in 2019.



ChrisTURNER