IDETC/CIE 2020 Virtual Workshops

Workshop 1 (1PM – 5PM): Let Us Use Instinct More in Engineering

Organizers: Shuichi Fukuda - shufukuda@gmail.com
Wednesday August 19th

Environments and situations come to change frequently and extensively, and these changes become unpredictable. We are thrown in the flow. We need to explore the new way, depending on our own personal capabilities, to swim against the flow and get to our destination. There is no other way than to learn by trial and error. But, how can we? Engineering up to now is largely control-based because changes were smooth so that we could predict the future. But today, tomorrow is another day. No matter what environment and situation come up, we need to win the game. If we look at invertebrates, the octopus is typical. Ann octopus can survive on instinct alone, without any knowledge. In fact, the octopus dies soon after its offspring are born. Therefore, there is no inheritance of knowledge from the previous generation. Still, the octopus is known as the expert of escape across environments and situations. This is because they interact with the real world directly. Our engineering is knowledge-centered, but to cope with unpredictable changes, we need to move to be wisdom-focused. To achieve this goal, we should pay attention to our instinct and consider how we can utilize it more in engineering to win this challenging game.

Workshop 2 (1PM – 5PM): Modelling for periodic simulation of diurnal cycle in attic space

Organizers: Anuj Gupta & Bhavyanidhi Vats - anuj.mech.gupta@gmail.com
Wednesday August 19th

Attic spaces encounter major heat losses from a building. A large number of studies has been published for the simulation of attics in terms of natural convection. In reality, the conditions of a typical day lead to an initial increase in temperature of the surrounding environment with the rise of sun, and after reaching a peak, temperature starts decreasing. As a result, steady-state attic analysis is not representative of the actual conditions. This workshop presents a methodology for modeling the diurnal cycle using ANSYS Fluent.

Workshop 3 (1PM – 5PM): Navigating Conferences: Successful Collaboration and Co-Authorship

Organizers: Elizabeth Starkey, Nicole Damen, Charlotte de Vries, & Christine Toh - ems413@psu.edu - (Pennsylvania State University & University of Nebraska Omaha)
Wednesday August 19th

The workshop is designed to provide graduate students and faculty members from underrepresented groups with professional development activities and to give them the opportunity to make connections with an international network of supportive researchers within the Design Engineering Division (DED) of ASME. In addition to skill development, this workshop will support the development of a network of people within the community from underrepresented groups. As the eleventh annual workshop event of the Broadening Participation Committee of the ASME DED, this workshop focuses on helping attendees choose appropriate co-authors and collaborators in order to develop their own research path. Attendees will learn skills to improve productivity, choose co-authors/collaborators, and manage co-author/collaborator relationships. Attendees will reflect on their individual goals, map out their network of collaborators, and build blueprints for achieving their goals.

Workshop 4 (1PM – 5PM): Motion Design Using a Novel Robot Kit and a Mechanism Design app

Organizers: Anurag Purwar - anurag.purwar@stonybrook.edu - State University of New York at Stony Brook
Wednesday August 19th

This workshop will demonstrate a state-of-the-art app called MotionGen for designing and simulating planar linkages and a novel robot kit called SnappyXO for rapid prototyping of the robot motions and structures. The app and robot kit are being used in Freshman Design Innovation, undergraduate and graduate Kinematics classes at Stony Brook University. The SnappyXO robot kit is a low-cost, modular, and innovative kit, which allows structural prototyping of robot chassis and their motions. It works with off-the-shelf electronics, open source software, and employs an open architecture to allow users to design and make their own parts.

Workshop 5 (1PM – 5PM): Introduction to resilience modeling in fmdtools

Organizers: Daniel Hulse - hulsed@oregonstate.edu - Oregon State University
Wednesday August 19th

Many modeling advancements and methodologies have been presented in the literature to improve the resilience of complex engineered systems. However, a lack of publicly-available open-source tools has made it difficult to perform research in this area, since one must either rely on proprietary tools or re-implement methods oneself to apply and/or extend them. The fmdtools Python toolkit solves this problem by providing model-defining classes, fault propagation algorithms, and analysis methods that, when applied together with a user-defined model, constitute an environment for resilient design. This workshop will cover the basics of resilient design in fmdtools, including an overview of supported use-cases; an introduction to the toolkit struc classes and methods; installation; a baseline example of implementing a simple model; and development for ongoing contribution/collaboration.