Society for the Advancement of Material and Process Engineering

SAMPE
Los Angeles Chapter
News and Information

March 2020

Advanced Manufacturing Methods and Techniques Presented at

Q P E TECHNICAL INSTITUTE IN ANAHEIM

IS CANCELLED DUE TO THE CORONAVIRUS

ADDRESS:

Canceed

PARKING:

Cancelled

TIME:

Cancelled

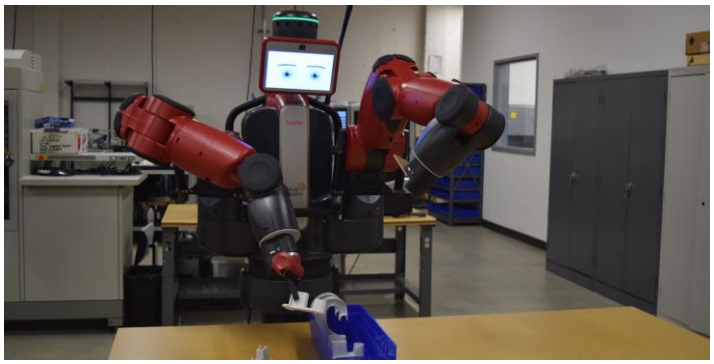
RESERVATIONS:

Cancelled

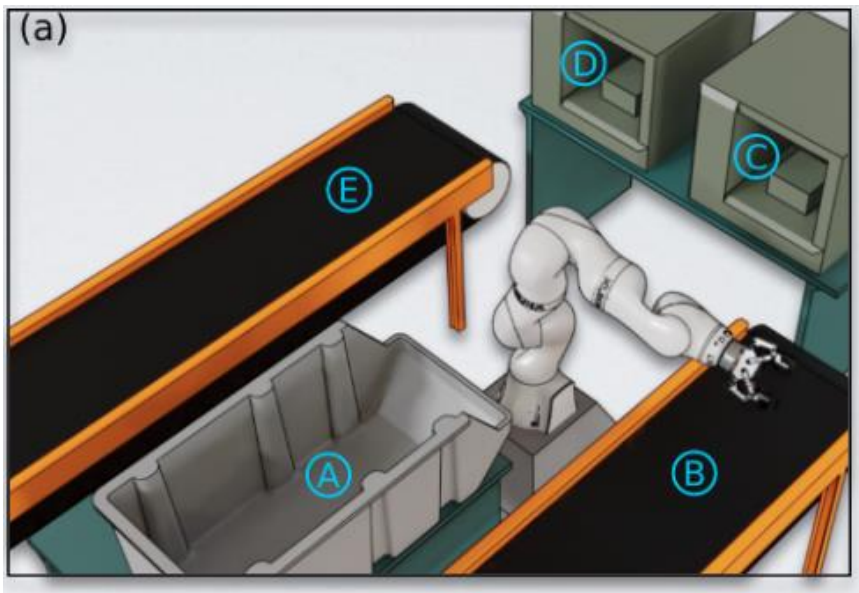
Presentation by Dr. Ariyan Kabir and Dr. Brual Shah from the USC Center for Advanced Manufacturing

Realizing Smart Robotic Assistants for Manufacturing Applications through Advances in Artificial Intelligence

Traditionally, industrial robots have been used on mass production lines, where the same manufacturing operation is repeated many times. Many sectors of manufacturing such as aerospace, defense, shipbuilding, mold and die making involve small production volumes and high-mix tasks. Currently, industrial robots are not used in such applications. The use of robotic assistants can significantly improve human operator productivity in small production volume manufacturing and eliminate the need for human involvement in tasks that pose risks to human health. Recent advances in human-safe industrial robots present an opportunity for creating hybrid work cells, where humans and robots can collaborate in close physical proximities. This capability enables realizing systems that utilize the complementary strengths of humans and robots. Several low-cost robots have been introduced in the market over the last few years, making them attractive in many new manufacturing applications where robot utilization is not expected to be very high. This makes the idea of hybrid cells economically viable for small volume production. This presentation will describe computational foundations for creating robotic assistants for high-mix manufacturing tasks. We will begin with an overview of an integrated decision-making approach that brings together concepts from perception, planning, control, and learning to realize robotic assistants that can aid human workers in manufacturing.



manufacturing. Traditional off-line robot programming approaches cannot be used on high-mix tasks. We will describe a new decision-making approach based on the integration of real-time planning and perception for performing high-mix tasks using robots. There are many challenging tasks for which a simulation-based planning approach cannot be used to select the optimal process parameters. For such tasks, we will describe a new approach for robots to learn task parameters from self-exploration. Both humans and robots can make errors in a hybrid cell, hence creating contingency situations. Unless handled promptly, a contingency situation may lead to significant operational inefficiencies. We will describe a decision-making approach for detecting and managing contingencies. Bin picking, assembly, and cleaning tasks will be used as illustrative examples to show how robots can be used on high-mix manufacturing tasks.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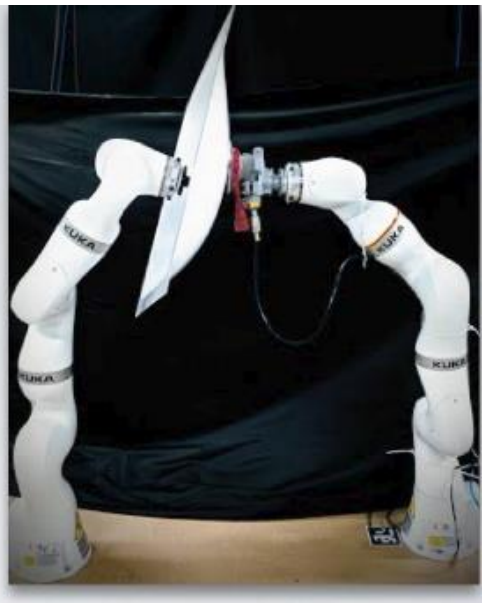

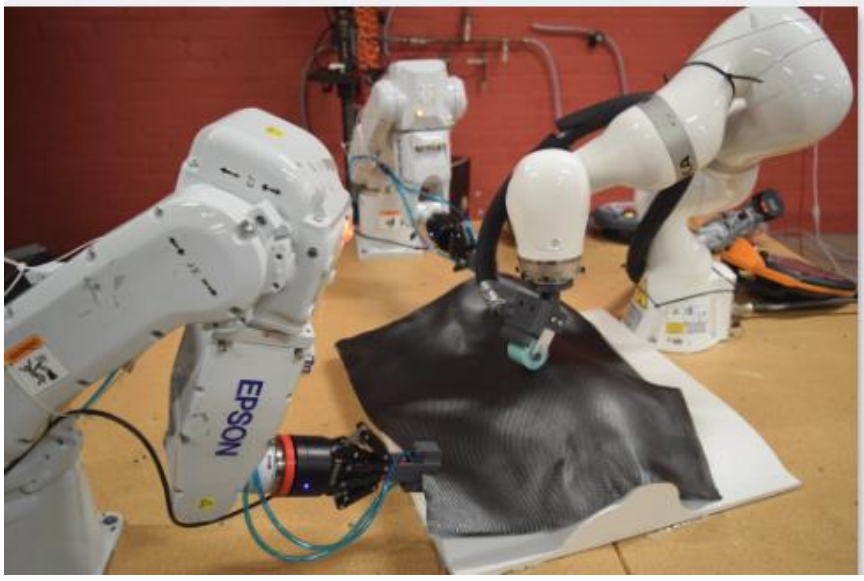
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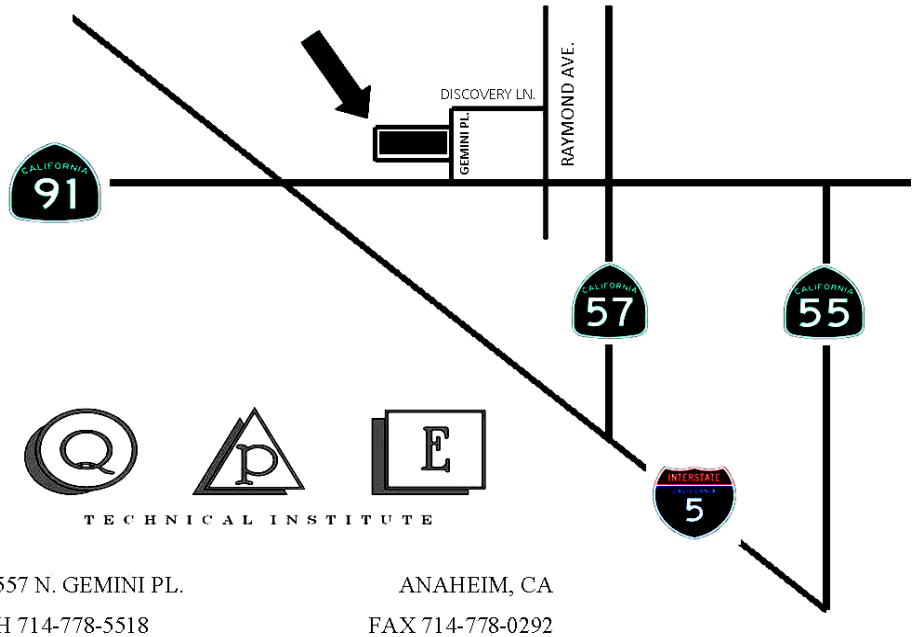
About QPE Technical Institute

In 1987, Q P E Technical Institute was founded with the mission to deliver the highest level of educational experience to the student who wishes to acquire the skills necessary to compete in the manufacturing industry. Q P E Technical Institute strives to develop the students' analytical approach to problem solving, team building, and the continuous improvement of skills through education.

Specializing in the disciplines of CNC Machining, CAD-CAM, & Dimensional Metrology, Q P E Technical Institute strives to maintain a modern facility that houses the equipment and tools required to provide an education that meets the expectations of the student, faculty, and community. This educational environment will parallel industrial standards for equipment and techniques.

It is our mission to maintain communication with the manufacturing community in an effort to meet their demands of a skilled workforce. Through this collaboration, a dynamic education curriculum is maintained, ensuring the contemporary approach to skill development.

Q P E Technical Institute delivers structured educational services at its own facility but also works with individual employers to develop customized training programs delivered on-site. These training programs are facilitated by the State of California Employment Training Panel.



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Last Month's Presentation at UCLA

Last month's presentation was Machine Learning Approaches to the Design of Optical Materials: From Inverse Design to Explainability by Professor Aaswath Raman. This presentation and pizza dinner was organized by the SAMPE UCLA Student Chapter. A couple of pictures are shown below.

Irene Epstein Scholarship

The Irene Epstein Memorial Scholarship Awards were initiated in 1996 shortly after the death of Irene Epstein, to honor her volunteer efforts on behalf of the Society for the Advancement of Material and Process Engineering (SAMPE), and to recognize her strong desire to assist financially-needy, academically-deserving students at Fairfax High School (Los Angeles) to attend college to study engineering, science, mathematics, or medicine.

The Irene Epstein Memorial Scholarship Awards program was initially funded by contributions from The Aerospace Corporation and SAMPE. It is also supported by the Air Force Space Systems Manufacturing Problem Prevention Program (MP3).

The program is administered by Dr. Howard A. Katzman, Senior Scientist at The Aerospace Corporation, and Education Chairman of the Los Angeles Chapter of SAMPE.

Many individuals and companies have generously contributed to help the fund grow so the amount of the scholarship awards has increased five-fold since it started. In addition, a special Book Awards was introduced three years ago to help selected students in the purchase of their college textbooks. If you would like to make a donation or learn more about the scholarship, please contact Dr. Howard A. Katzman at 310-336-5860 or e-mail him at Howard.A.Katzman@aero.org.

Schedule of Upcoming Events

Event	Location	Date
Advanced Manufacturing Methods and Techniques	Anaheim, CA	Cancelled
Rapid + tct (Addative Manufacturing)	Anaheim, CA	April 20 – 23, 2020
SAMPE 2020	Seatlle, WA	May 4 – 7, 2020
Space Tech Expo	Long Beach, CA	May 18 – 20, 2020

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Our list of sponsors is growing!!! Sponsors get monthly exposure in our mailing to over 750 members and associates of the local chapters of SAMPE. Sponsors also get a link to their corporate webpage via the SAMPE Los Angeles Chapter website.

For information on being a sponsor, please contact:

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(310)336-5860