

"Developing VR Simulations for Teaching Nanotechnology Instrumentation"

Friday, May 14, 2021

9 AM - 1 PM Mountain Time (UTC - 6)

11 AM - 3 PM Eastern Time (UTC - 4)

VIRTUAL WORKSHOP SCHEDULE

- 09:00 Welcome (Paul Weber), introduction of keynote speaker
- 09:05 *Prof. Marc Madou, UC-Irvine, Dept. of Mechanical and Aerospace Engineering*
KEYNOTE ADDRESS - "Carbon-MEMS Self Assembly"
Recent results from Prof. Madou's research group that is working to program polymer materials to self-assemble into 3D shapes, and then to convert them into 3D carbon shapes.
- 09:35 Questions
- 09:40 *Dr. Marty Clayton, Department of Digital Media, Utah Valley University*
"Designing easy-to-use VR experiences"
The genesis of virtual reality simulations at UVU for training students in the safe and effective use of nanotechnology equipment will be described, including effective design features and methods of implementation.
- 10:10 Questions
- 10:15 *Dr. Paul Weber, Utah Valley University, Physics Department*
"Classroom experiences with VR simulations, assessing effectiveness"
Virtual reality simulations have been instituted at UVU for pre-training in three different laboratory experiments, and student reactions will be described as well as experiences the UVU group has had to date with appealing to industry as potential clients for new VR simulations at their facilities.
- 10:30 Questions
- 10:35 *Dr. Magesh Chandramouli, Purdue University Northwest, Computer Graphics Tech.*
"Manufacturing Education and Training using VR"
Project MANEUVER is developing an innovative multi-modal VR framework for DM instruction. This framework decouples the 3D DM database from functionalities, thus giving the instructional designer access through immersive, augmented, and desktop VR. During manufacturing process training, VR tools serve as a viable alternative offering a cost and material-efficient solution. Industry standard software and hardware is being used to develop and deliver advanced DM exercises for instructional and training purposes. Using a "train-the-trainers" approach, a replicable faculty development model is being developed for secondary and post-secondary institutions. By addressing regional and national entry-level workforce needs, the project benefits society and contributes to national economic progress and prosperity. Workshops have been delivered in the states of Indiana, Tennessee, and Washington to high school

and community college instructors and MOOC (Massive Open Online Course) videos have been disseminated through the online tools.

11:05 Questions

11:10 Pause

11:15 *Ash Black, Mentor in Residence and Director of Tech Core, University of Arizona*
Trevor Hoshiwara, Lead Emerging Technologist, University of Arizona

"The NANO 2020 Virtual Reality Initiative"

A new initiative at the University of Arizona's Tech Core is described, an innovative student engagement experience for teaching challenging concepts of nanotechnology through virtual reality, which can be extended to other technology programs.

11:45 Questions

11:50 *Jonathan Beck, National Center for Autonomous Technologies, Northland C.C.*
Jill Zande, Marine Advanced Technology Education (MATE) Center, Monterey, CA
Mark Gill, St. Cloud State University Visualization Lab (VizLab)

"Supporting STEM Competitions using VR for Social Engagement"

Working together, NCAT and MATE have taken a deep dive into the depths of Virtual Reality to reimagine the 2021 MATE ROV Competition. It includes not only in-person and telepresence events, but also a virtual world that enables students and mentors from around the globe to experience the competition even if they can't participate in person. The international MATE Remotely Operated Vehicle Competition, engages more than 7000 students from all over the US and more than 30 countries. The team's planning and creativity to strategically use virtual collaborative environments for the 2021 MATE ROV Competition will allow MATE to facilitate social interaction, peer-to-peer networking, and shared experience that students value and appreciate most about the competition – and are especially craving during the time of this pandemic.

12:20 Questions

12:25 *Dr. Craig Priest, ANFF-SA, University of South Australia, Adelaide, , S.A., Australia*

"Nanotechnology Outreach Programs at ANFF-SA"

A very successful outreach program has been developed by the South Australian node of the Australian National Fabrication Facility, a \$20M investment dedicated to micro/nanofabrication of emerging technologies. A./Prof. Priest strategically uses industry engagement and research to enrich student experiences and employment outcomes, including founding the ANFF-SA Microengineering Winter School which has now trained over 450 students.

12:55 Summary, wrapup (Paul Weber)

13:00 End