

Additive Manufacturing for Medical Applications

25th June 2021 | 6:00 To 7:30 Pm (IST)

Abstract:

Additive manufacturing as a revolutionizing manufacturing technology has been adopted for numerous applications in biomedical, aerospace, and automobile industries. This talk will discuss medical applications of 3D printing in combating the global COVID-19 crisis and in printing teeth models for orthodontics.

COVID-19 is a global crisis that has resulted in significant losses. 3D printing technologies have been used to fabricate medical devices and personal protective equipment (PPE) due to shortages of essential parts and constrained supply chains. Because of the high-level of customization and rapid prototyping capabilities, 3D printing also completes existing manufacturing technologies. Ventilator valves, face shield, face masks, swabs have been designed and printed to support healthcare systems worldwide. Binghamton university is one of the pioneers in US that adopted 3D printing to combat this COVID-19 crisis.

Besides its advantages in emergency situations, 3D printing is also greatly impacting regular medical applications such as orthodontics. This talk will also include a research activity that evaluates the dimensional accuracy of 3D printed teeth models for orthodontics. We 3D scanned teeth of four anonymous patients and printed the teeth models using the 3D scanning data. To evaluate the dimensional accuracy, we measured and compared eight important dimensions on the models. Results show that the 3D printed teeth models using stereolithography are accurate and typically have dimensional variances less than 2%.



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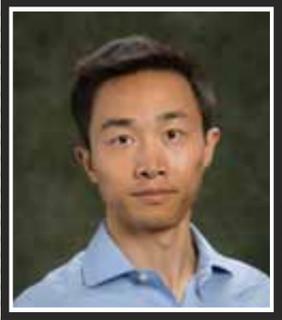
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JOINT SEMINAR SERIES

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Jia Deng joined the department of Systems Science and Industrial Engineering at Binghamton University as an assistant professor in 2017. He earned a B.S. degree in 2010 from Wuhan University of Technology, Wuhan, China in the field of Process Equipment and Control Engineering. In 2013, he received a M.S. degree in Mechatronics Engineering from Huazhong University of Science and Technology, Wuhan, China. In 2017, He earned his Ph.D. in Industrial Engineering from North Carolina State University, Raleigh, North Carolina. His research interests include process innovations and applications of AFM-based nanomanufacturing and additive manufacturing in biomedical fields.