



Friday, January 19 • 2:30 PM

UTEB 175

## Development of Scalable and Expeditious Additive Manufacturing (SEAM): A Solution to High Production Additive Manufacturing

Dr. Haseung Chung  
Associate Professor

Department of Mechanical Engineering  
Michigan State University, East Lansing, MI

**Abstract:** For the past 40 years, metal additive manufacturing (AM) technologies with the capability of fabricating highly complex metal components with virtually no geometrical limitations, has enabled new opportunities in product designs and performance, reducing total cost and shortening lead time, improving material efficiency and creating more sustainable products. A significant attention and interest of manufacturing industry lies on where metal AM can replace or improve production capability of traditional manufacturing (TM). While metal AM processes are capable of providing individually designed product with a high level of details, TM processes with their fast, precise, and efficient production in combination with the long-established, quality assured, and widely implemented manufacturing techniques makes the competition incredibly difficult for AM when it comes to high volume production.

As metal AM field evolves with an increasing demand in highly complex and customizable product, there is a critical need to fill in the gap in terms of production speed between metal AM and TM processes. This presentation will cover the development of the scalable and expeditious additive manufacturing (SEAM) process, which hybridizes binder jet printing and stereolithography principles, capitalizes on their advantages to produce a new metal AM processing route. The SEAM process is not only suitable for high production environment but also capable of fabricating components with excellent accuracy and resolution. Once fully developed, the process is well suited to bridge the productivity gap between metal AM and TM processes, making it an attractive candidate for further development and future commercialization as a solution to high production AM.

**Biographical Sketch:** Dr. Haseung Chung is currently an Associate Professor in the Department of Mechanical Engineering at Michigan State University (MSU). Before he joined the Michigan State University in 2017, Dr. Chung was a Research Associate Professor in the Department of Mechanical Engineering at the University of Michigan (UM) and Associate Professor in the Department of Mechanical and System Design Engineering at Hongik University in Korea. Dr. Chung received his B.S. (1998) and M.S. (2000) degrees from Seoul National University in Korea. He completed his Ph.D. degree in 2005 at UM and continued to work as a Post-Doctoral Research Fellow until 2006. Dr. Chung's professional interests and recent research include developing new additive manufacturing processes, magnetic-field assisted finishing (MAF), optimizing additive manufacturing for bio-medical applications, cyber manufacturing systems, etc. Dr. Chung has led various projects funded from NSF, DOE, ONR, NIH, and several industries as PI or Co-PI. He is awardee of 2023 NSF CAREER and 2019 Hanwha Q CELLS & Advanced Materials Non-Tenure Faculty Award. He has published about 50 papers in peer-reviewed journals and has been serving as an associate editor for three different peer-reviewed journals (Journal of Manufacturing Processes, International Journal of Precision Engineering and Manufacturing- Green Technology, Journal of Mechanical Science and Technology).