

## **Prof. Faez Ahmed**

### **\*Title\***

Rethinking Engineering Design with Generative AI

### **\*Abstract\***

Generative AI is reshaping many industries by offering innovative content creation approaches. While tools like ChatGPT have proven effective in multimedia, their application in engineering faces unique challenges, such as maintaining precision under varying requirements. This talk will explore some of these challenges, with an emphasis on achieving designs that are innovative, feasible, and achieve high functional performance. We will examine case studies across various engineering disciplines, such as kinematic design. Furthermore, we will explore how precision-focused generative AI can transcend mere mimicking statistical patterns to address performance, constraints, and innovation in engineering. The talk will show examples of AI-drive design co-pilots for engineering tasks along with covering methods that effectively combine multimodal generative models with engineering optimization and tools, highlighting how this fusion augments the design process. The presentation will conclude by highlighting the broader impact of generative AI in facilitating design democratization and fostering rapid innovation across the engineering sector.

### **\*Bio\***

Prof. Faez Ahmed is the ABS Career Development Assistant Professor in the Department of Mechanical Engineering at the Massachusetts Institute of Technology (MIT). He leads the Design Computation and Digital Engineering (DeCoDE) lab, with a research focus on Artificial Intelligence for engineering design. His recent work addresses the Generative AI-based synthesis of high-performance and novel designs, multi-modal representations, and the collaborative potential between human designers and machines. Prior to his appointment at MIT, Prof. Ahmed was a postdoctoral fellow at Northwestern University and earned his Ph.D. in Mechanical Engineering from the University of Maryland. He has industrial experience in Australia's railway and mining sectors, where he championed data-driven predictive maintenance initiatives. Prof. Ahmed is dedicated to enabling a future where humans and AI design together to solve the world's most pressing challenges.

### **Photo**

