

Computational Fabrication and Assembly for In Situ Manufacturing

Monday, February 12th, 2024
12:30 PM

Maeder Hall Auditorium

MAE Special Seminar Series



Martin Nisser
*Massachusetts Institute of
Technology*

The space environment is remote and unpredictable, and the ability to manufacture in situ offers unique opportunities to address new challenges as they arise. However, the challenges faced in space are often mirrored on Earth. In hospitals, disaster zones, low resource environments and laboratories, the ability to manufacture customized artefacts at points of need can significantly enhance our ability to respond rapidly to unforeseen events. In this talk, I will introduce digital fabrication platforms with codeveloped software and hardware that draw on tools from robotics and human-computer interaction to automate manufacturing of customized artefacts at the point of need. Highlighting three research themes across fabrication machines, programmable materials, and modular assembly, the talk will cover a digital fabrication platform for producing functional robots, a method for programming magnetic material to selectively assemble, and a modular robotic platform for in-space assembly previously deployed in microgravity.

Martin Nisser is a PhD Candidate in the MIT Computer Science and Artificial Intelligence Laboratory, working with Professor Stefanie Mueller. He holds degrees from MIT, ETH Zurich, and The University of Edinburgh, and has interned and held staff appointments at The European Space Agency, Tesla Motors, Harvard University, and the Boston Dynamics AI Institute. He is a Sweden-America fellow, a Bernard Gold fellow, and his work has appeared in media including BBC News, The NBC Daily Show, The Washington Post, NASA TV, and Popular Science.