

## Soft Mechanical Metamaterial Robots for Opaque Envelope Retrofits

By 2050, most U.S. residential and commercial buildings will be more than 30 years old and require costly and disruptive retrofits to achieve energy efficiency. Our solution is to replace costly machines with low-cost metamaterials to produce soft shelled, low-profile envelope retrofit robots that navigate tight spaces where humans and servo-controlled robots can't reach. Our team are leading experts in the engineering and commercial development of mechanical metamaterials, which are produced from embedding repeated geometric patterns in conventional materials. This combination leads to new functionality that we leverage for soft robot locomotion and navigation. Equipping our system with a camera and applicator for spray-in insulation leads to a productivity-enhancing sensing, inspection, and retrofit tool. For the E-ROBOT competition, we created an industry-academic collaboration to bring together a team with a remarkable track record of success.

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### Key Partners:

Multiscale Systems – Worcester, MA

Armory Technologies – Avon, CT

Santa Clara University – Santa Clara, CA

Worclab – Worcester, MA (American Made Connector Support)