

RetRobot HighR: Robotic retrofitting of buildings with highly insulating, transparent aerogels

Short description:

We develop holistic solutions to retrofit building envelopes (including windows) with thermally super-insulating, low-cost, durable materials. We use robotics, AI and machine learning in mapping, retrofitting and inspection to make our solution robust and affordable. Our solution combines Mars-Rover-grade, high-R thermal insulation in the forms of monolithic mesoporous film or granulated aerogel materials and autonomous robotic platforms that collaborate with humans. We aim to make retrofits efficient, nondisruptive, economically attractive and achieving ultra-high boost of the thermal insulation (R-value) of different components of the building envelope, including its least insulated parts like windows and skylights.

Key project members:

(1) Professor Ivan I. Smalyukh, iFeather Technologies Inc. and University of Colorado Boulder
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(2) Professor Nikolaus Correll, Robotic Materials Inc. and University of Colorado Boulder
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(3) Jennifer Shih, Architect, Pocci Design Group and the U.S. Green Building Council (volunteering), Boulder, Colorado

RetRobot HighR team's location: Boulder, Colorado

Other Partners:

To extend the proposed solution during the Phase II, additional partners and collaborators include iFeather Technologies Inc. and Robotic Materials Inc., manufacturers of materials, glass insulating units and windows, startup accelerators, investor networks, National Glass Association, The U.S. Green Building Council, certification facilities of glass industry and national labs, and top robotics researchers at several different US universities