Innovation Practices: Co-Creation in Technology Sectors in North American Cities

Katlyn Turner, Kristi Acuff, Sebastian Pfotenhauer, Danielle Wood
Space Enabled Research Group | MIT Media Lab

space enabled

Project Motivation + Overview

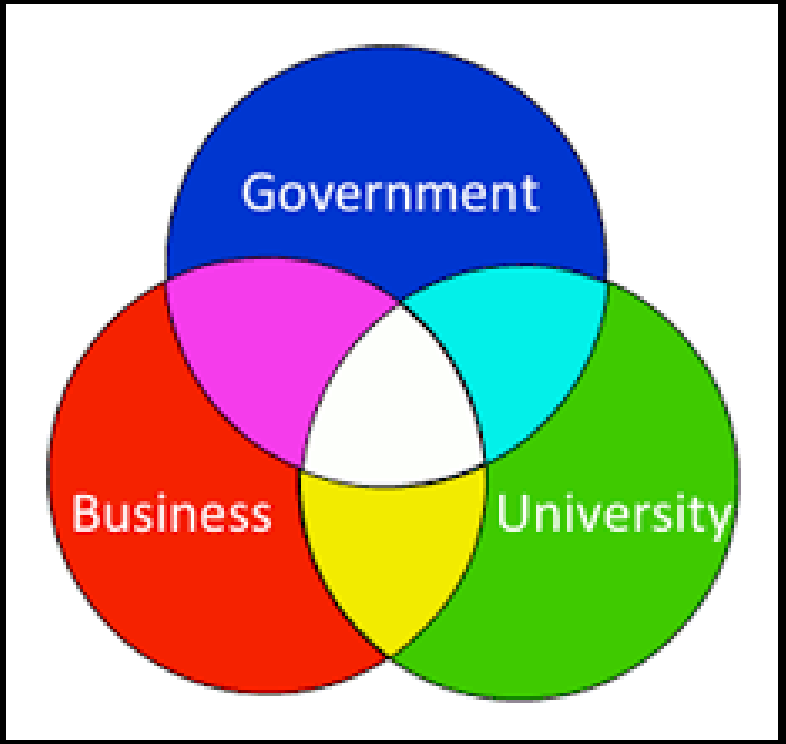
- Drawn inspiration from a project in the EU called SCALINGS
- Understand and learn about co-creation practices in innovation ecosystems
- Understand the role of cultural and geographical embeddedness in innovation practices in two distinct cities
  - Greater Boston
  - Detroit Metro Area
- Inclusive innovation practices
- Innovation across different technical sectors
  - Robotics
  - Urban energy
  - Space sector

Presentation today

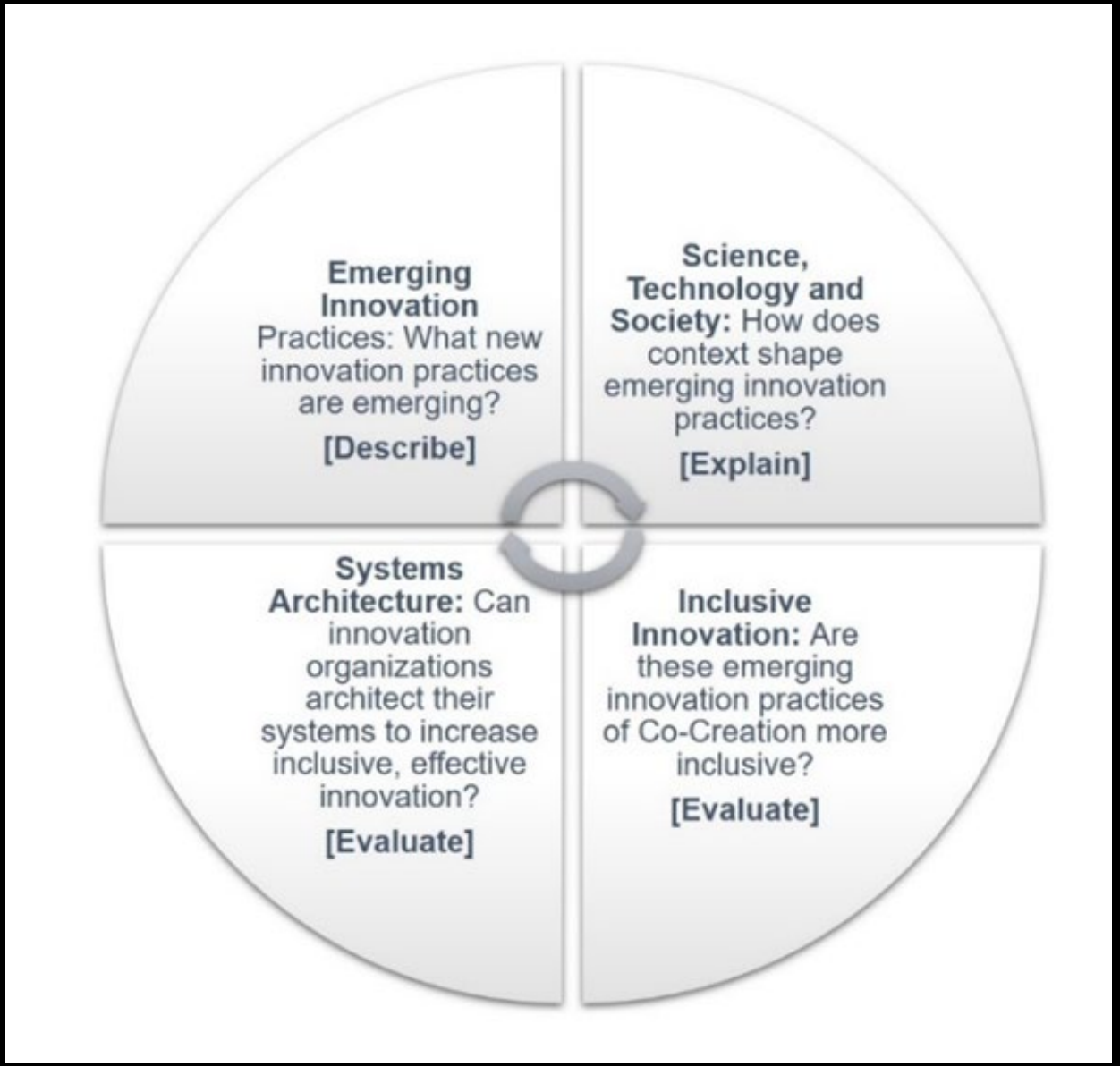
- Overview of project: theory, geographies, methods
- Past results
  - robotics and urban energy in Greater Boston
- Space sector in Greater Boston
- Future work

Innovation Studies and Co-creation

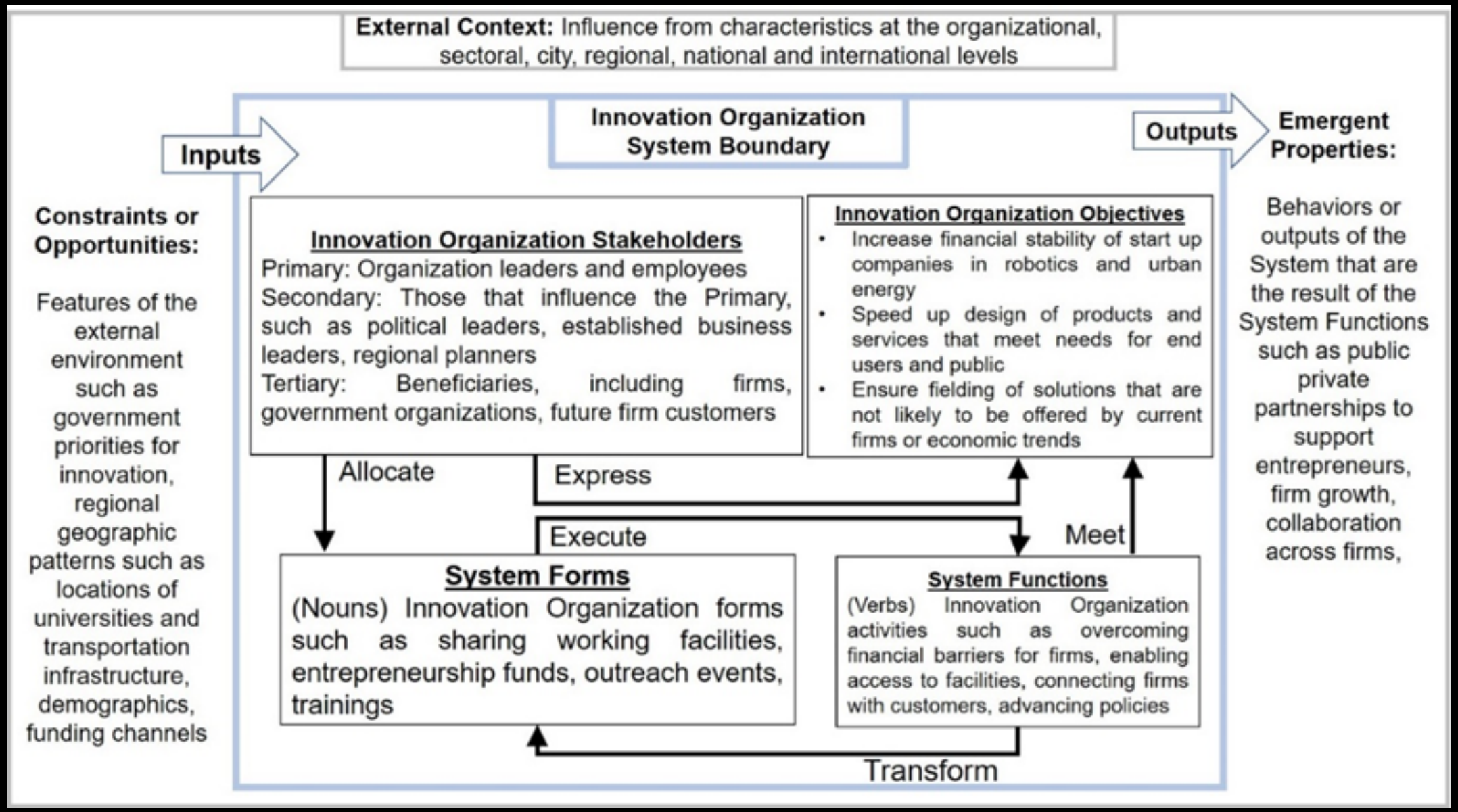
- Co-creation
  - Bring together diverse actors to create a mutually beneficial outcome
  - Convergence of different forms of research and practice
- Triple helix model
- Operationalized innovation models
  - MIT model
  - Silicon Valley model
- Geographical and cultural embeddedness
- SCALINGS as a multi city study across EU
- US study with similarities to SCALINGS
- Exploring the dynamics of US culture, hierarchies, histories on innovation practices
  - Greater Boston: established innovation hub
  - Detroit Metro: complicated city of progress + unrest



Theoretical Framework

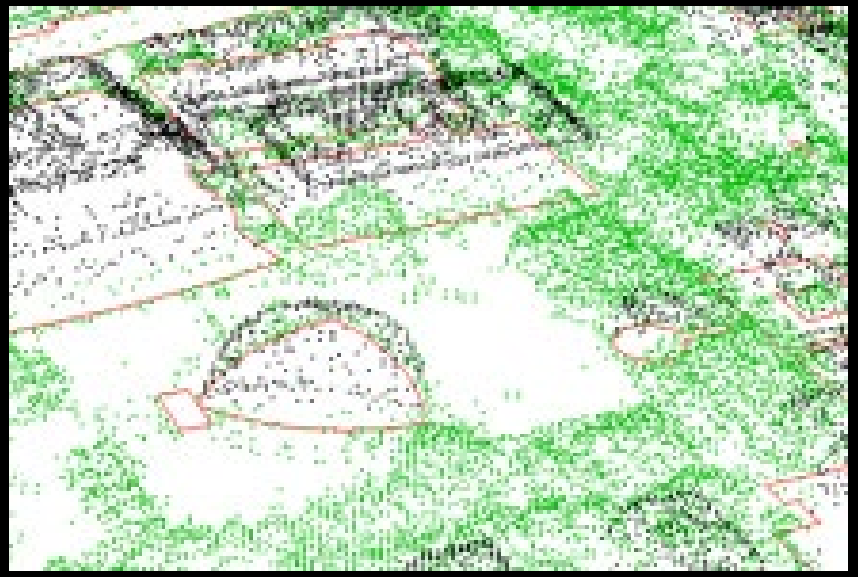


Systems architecture: innovation context



Robotics, urban energy, space sector

- Across applications
- Across scale
- Use in shared environments with human workers
- Different cultural and policy contexts, regulations



- Sustainability, net zero/emission reductions
- Technological as well as conceptual, organizational, structural innovations
- Closed-system case studies and pilots

- Space as a venue for experimentation in extreme environments
- Expanding contours of space exploration
- Space access, emerging technologies
- Overlap with sustainability, robotics

Living Lab and Co-Creation Facilities

- We define Living Labs as sites of collective invention, testing, and demonstration for future technologies and socio-technical arrangements under real-world conditions, while also providing an experimental space for new forms of collaborative innovation activity.

- We define Co-Creation spaces as open, physical or virtual infrastructures where a variety of disciplines work together on the development of collective innovation efforts. They can provide equipment-sharing open access facilities, lab space, expertise, equipment, and support staff to external clients, or act as platforms

Greater Boston and Detroit Metro

Massachusetts, USA

- Established “mainstream” innovation ecosystem
- Influence of universities, local + state policy, infrastructure
- Robotics, sustainability, biotech, space, manufacturing

Michigan, USA

- Complicated city of 20th century engineering, unrest, racial violence, decay
- Emerging unique innovation system: manufacturing giants + need for renewed infrastructure + social progressivism
- Robotics, automation, sustainability

Research Questions

I. (**Describe**) How are organizations using the innovation practices of hosting co-creation facilities and living laboratories to seek to spur innovation in the fields of urban energy and robotics?

II. (**Explain**) Why are organizations that seek to foster innovation choosing the methods that they are choosing and what is the role of regional cultural embeddedness to explain these choices?

III.(**Evaluate**) How are these organizations assessing success and to what extent are they meeting their standard for success?

IV. (**Evaluate**) How are organizations incorporating aspects of inclusive innovation into their practices, what are their standards of success for meeting inclusive innovation goals, and to what extent are they meeting their standards for success?

Methods

Iterative approach of data collection + analysis

- Phase 1: web resources data collection
  - systems architecture analysis
- Phase 2: interviews with representatives from organization
  - systems architecture analysis
  - interview coding, grounded theory
  - analysis of organizations separately and in relation to each other
- Phase 3: site visits
  - systems architecture analysis
  - geographical and cultural embeddedness

Results and Discussion

- Overall, CCFs and Living Labs in Detroit and Boston do share similarities with the definitions of these terms used in EU (SCALINGS)
- Robotics
  - integrating with existing infrastructure (e.g. manufacturing, automotives)
  - more cutting-edge new areas of innovation (e.g. co-bots, surveillance)
- Urban Energy
  - Living Labs as a setup, sustainability
  - innovation in the sense of policy, norms, infrastructure, organization, vs. technologies
- Space sector
  - Orgs don’t use co-creation, living labs, as terms to describe themselves, but share many of the same collaborative features

Research Questions 1 and 2 will be discussed in detail

Urban energy-Living Labs

How are living labs in Greater Boston in the sustainability sector seeking to spur innovation?

- Innovative ways of sourcing ideas
- Resource allocation
- Closed-system Innovation

Image from: https://www.bu.edu/igs/research/campus-climate-lab/about/

Living Labs not as spaces: instead as projects, courses, and funding opportunities at Harvard

Our living lab initiatives are focused in three areas:

Campus Sustainability Innovation Fund »

Climate Solutions Living Lab Course and Research Project »

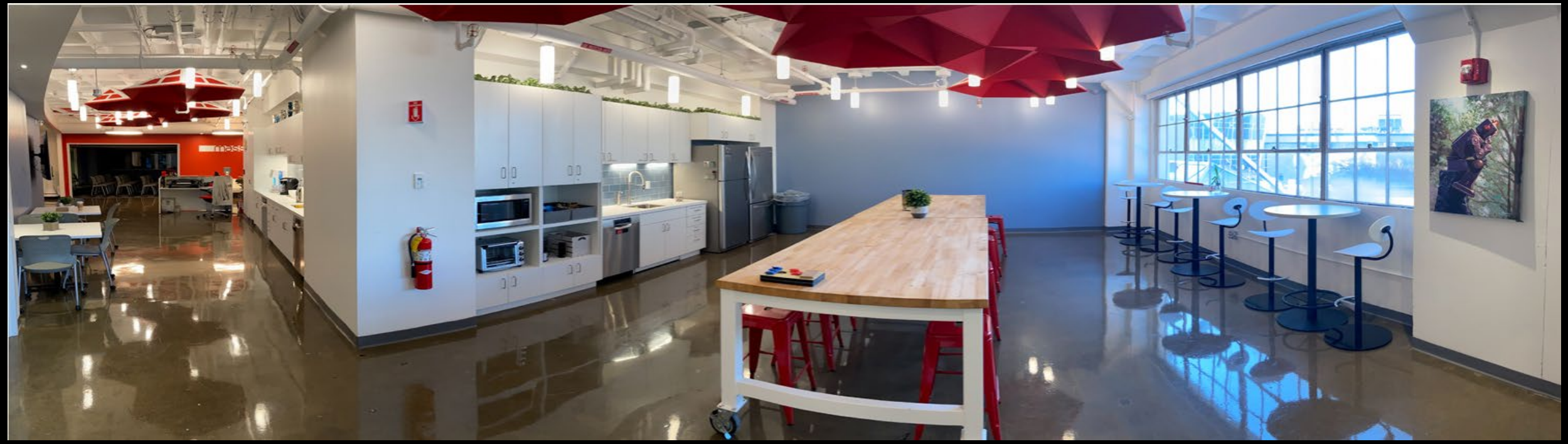
Student Grants »

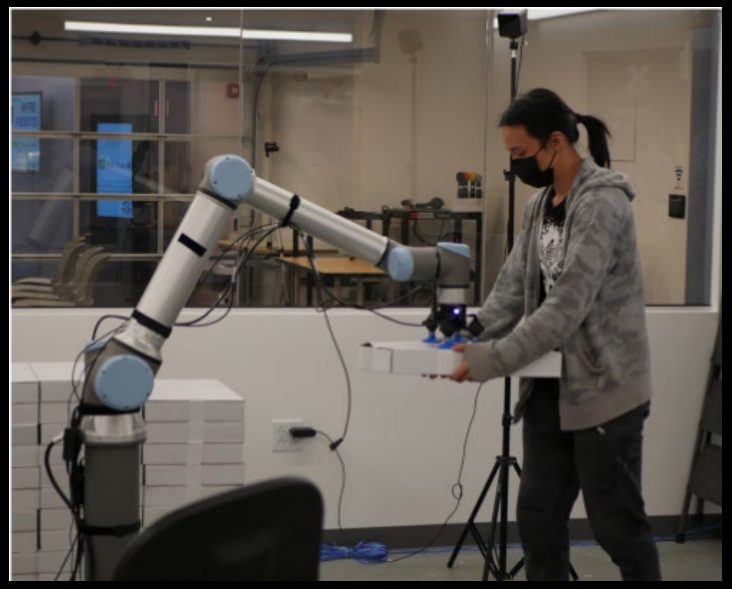
Image from: https://green.harvard.edu/series/living-lab

Robotics-CCFs

How are co-creation facilities in Greater Boston in the sector of robotics seeking to spur innovation?

- Network Innovation
- Workspace Innovation
- Team Creation Innovation
- Policy + Resource Investment Innovation
- Reputation Management





Images from: https://www.massrobotics.org/robotics-facility/

Living Labs & CCFs

Why are organizations in Greater Boston that seek to foster innovation choosing these practices; and what is the role of regional cultural embeddedness to explain these choices?

- **Living Labs**
  - Existing financial resources for sustainability
  - Using financial resources to fund student, staff, faculty work
  - Incentivizing global/outward facing work to be brought into Boston
- **Co-Creation Facilities**
  - Municipal and federal subsidies
  - Identification of need in robotics ecosystem
  - Availability of partnerships and expertise

Space sector

- Five case studies to date
- The role of the university sector in spurring space innovation
  - academia spinoffs
  - MIT
- Innovation for whom
  - space for the sake of space
- Greater Boston and space
  - outside perspectives
- Greater Boston and innovation
  - consolidation of excellence
  - creativity
  - pushing boundaries

Organization	Purpose
Space exploration initiative	Demoing imaginative + creative futures for space use
Aurelia institute	Designin future of space infrastructure
Axiom systems	Designing new propulsion systems
Redwire space	Creating flight hardware for space systems
Lunar station corporation	Data servicing for lunar project decision support

Conclusions

- Prioritization of the Detroit Metro case studies
- Exploration of other geographies to include
- Further analysis through systems architecture framework and case studies on the definition, implementation, role of inclusivity in innovation

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