



The Quest

Antonio Torralba | Director, MIT Quest for Intelligence

Aude Oliva | Executive Director, MIT Quest for Intelligence

Quest Leadership



Antonio Torralba
Director, Quest



Aude Oliva
Executive Director
Quest



Jim DiCarlo
Director, Quest Core



Nick Roy
Director, Quest Bridge



Daniela Rus
Associate Director, Quest Core



Cynthia Breazeal
Associate Director
Strategic Initiatives



Leslie Kaelbling
Scientific Director



Josh Tenenbaum
Scientific Director

What is the MIT Quest for Intelligence?

- The Quest aims to advance two fundamental intelligence challenges:
 - Can we reverse engineer intelligence?
 - How can we deploy our current and expanding understanding of intelligence to the benefit of society?
- The goal is to make true progress in our understanding of intelligence, and use that knowledge to create a better world



Who is involved in The Quest?

Architecture & Planning

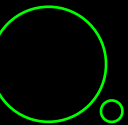
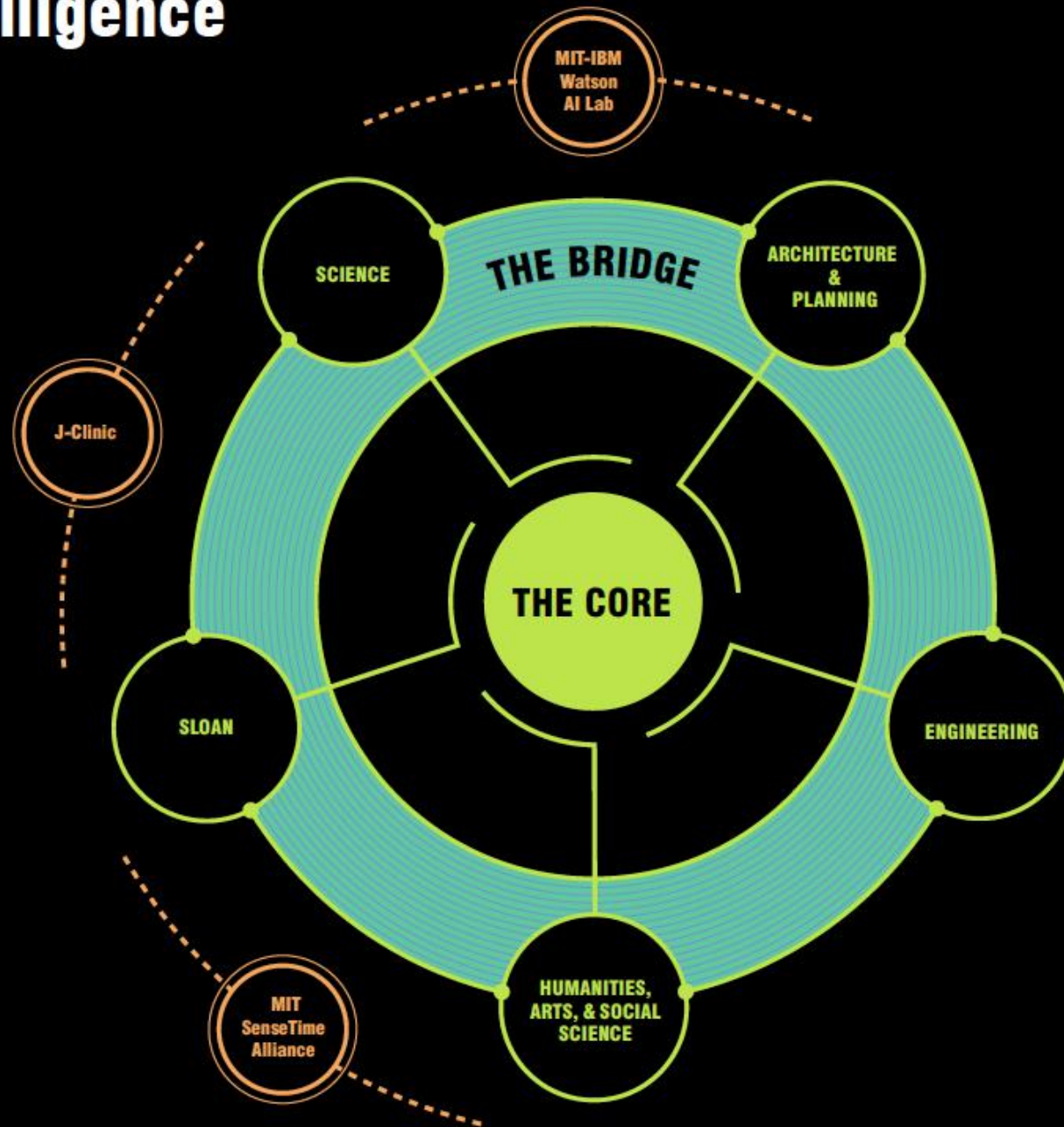
Humanities, Arts, & Social Sciences

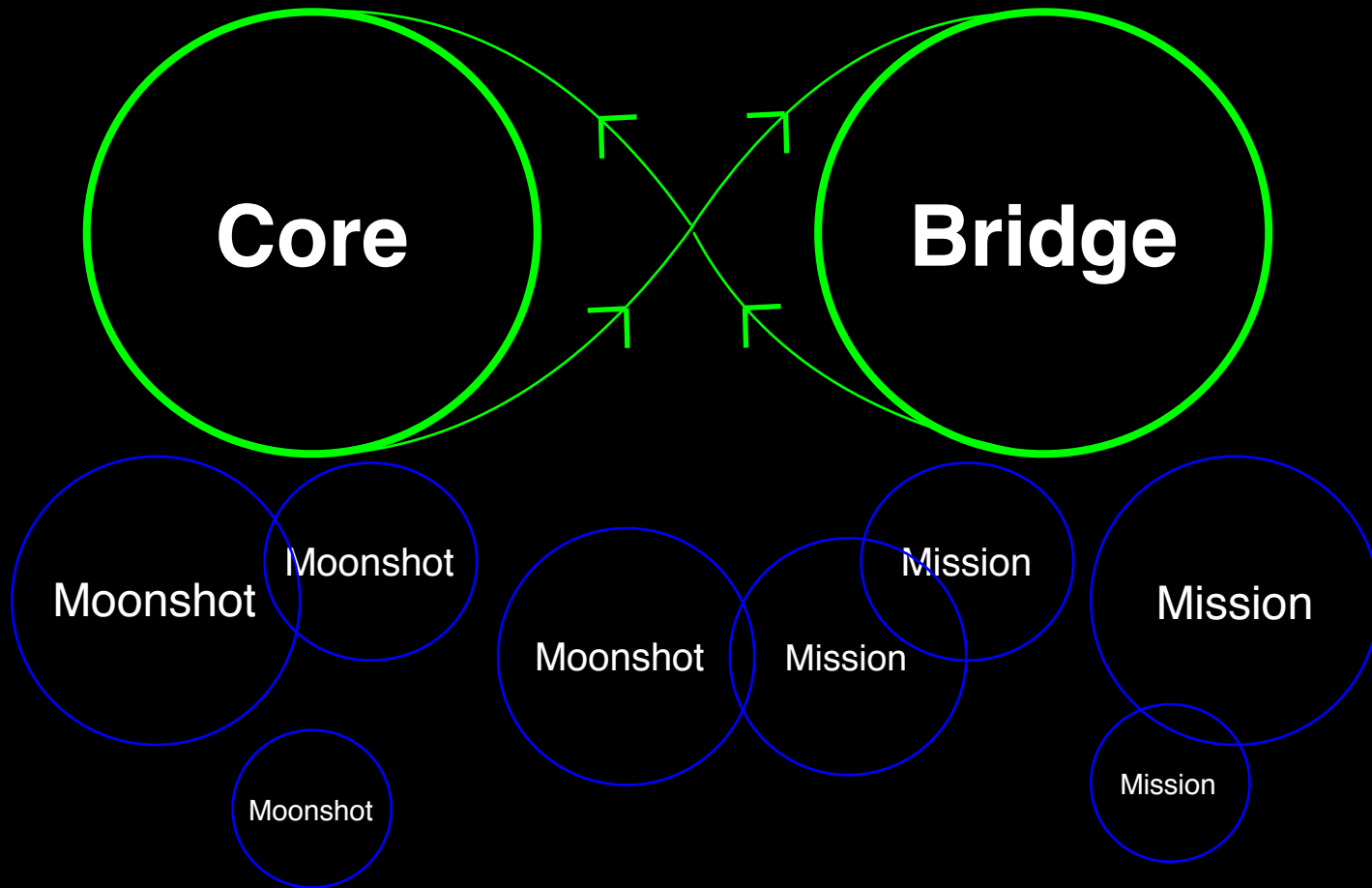
Engineering

Science

Sloan School of Management

MIT Quest for Intelligence





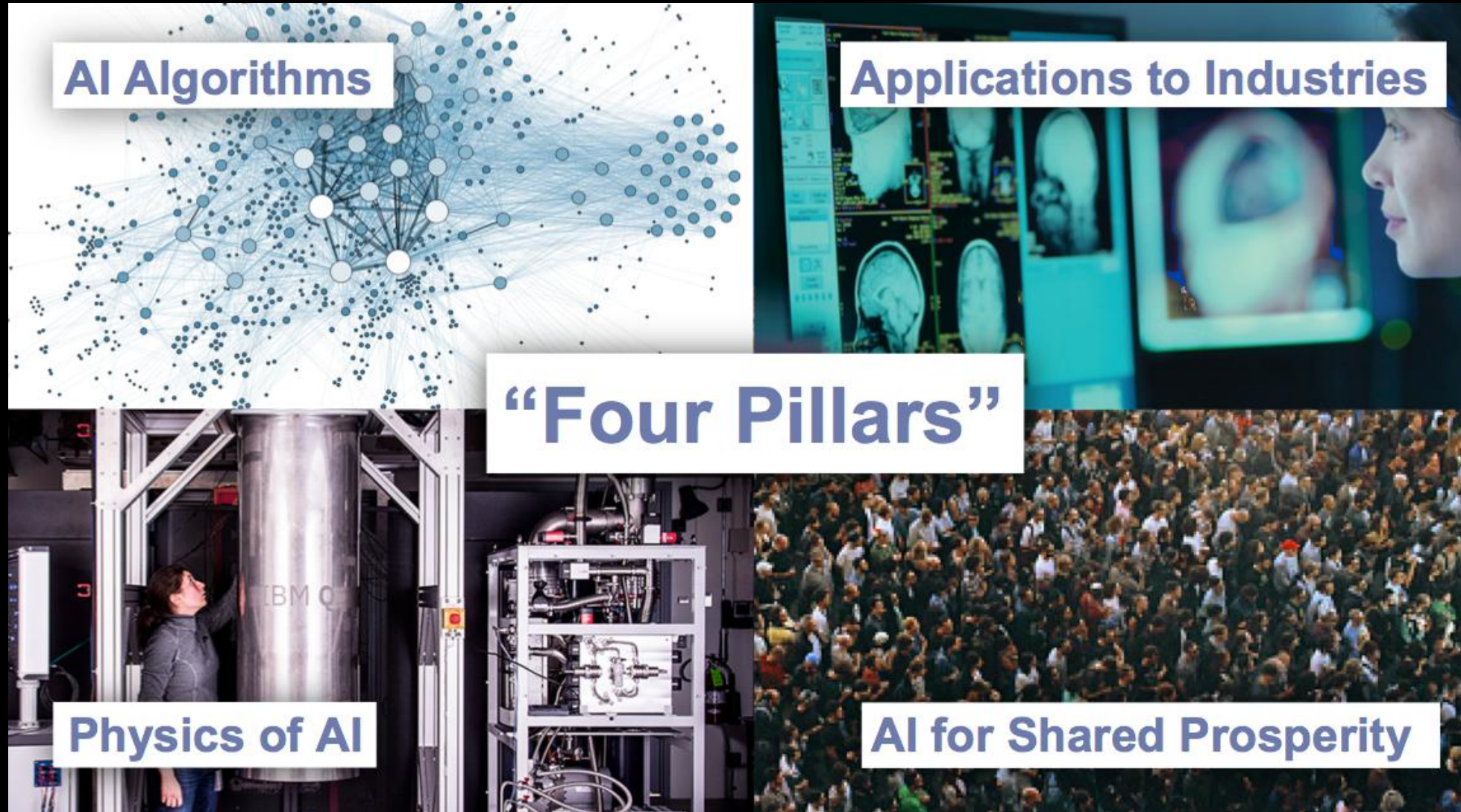


Collaboration

- MIT-IBM Watson AI Lab (*top left*)
 - Funding PI Research
 - UROPs
- MIT-SenseTime Alliance on Artificial Intelligence
 - Funding PI Research
 - UROPs
- Abdul Latif Jameel Clinic for Machine Learning in Health at MIT (J-Clinic) (*bottom-left*)

MIT-IBM Watson AI Lab

- 50 Research teams funded
- 60 MIT Principal Investigators
- 23 MIT Departments/Centers



MIT-SenseTime Alliance on Artificial Intelligence

The **MIT-SenseTime Alliance on Artificial Intelligence** opens new avenues of discovery across MIT in areas such as computer vision, human-intelligence-inspired algorithms, medical imaging, and robotics. SenseTime, founded by MIT alumnus Xiao'ou Tang PhD '96, specializes in computer vision and deep learning technologies.

The MIT-SenseTime Alliance on Artificial Intelligence is currently providing funding for 27 projects involving 50 principal investigators from MIT departments and labs within all five schools.

Current funded projects are answering questions such as:

- How can linguistic theory transform machine-learning algorithms to better approximate how people converse?
- How can artificial systems, like robots, learn common sense knowledge?
- How can tools in product design and systems architecture capitalize on strategies that combine human and machine intelligence?

Quest: **UROP Opportunities**

- Up to 100 new UROP opportunities for undergraduate researchers offered in Fall 2018 and Spring 2019
- Funding provided by:
 - Former Alphabet executive chairman Eric Schmidt
 - MIT-IBM Watson AI Lab
 - MIT-SenseTime Alliance on Artificial Intelligence
 - Anonymous donor, School of Engineering

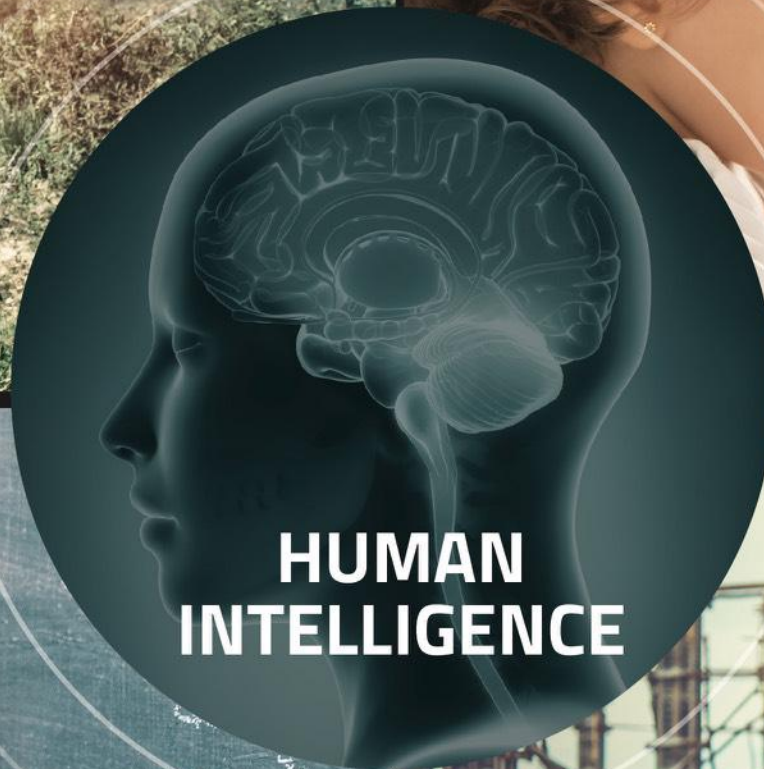


The Quest Core

James DiCarlo | Director, MIT Quest Core

Daniela Rus | Associate Director, MIT Quest Core





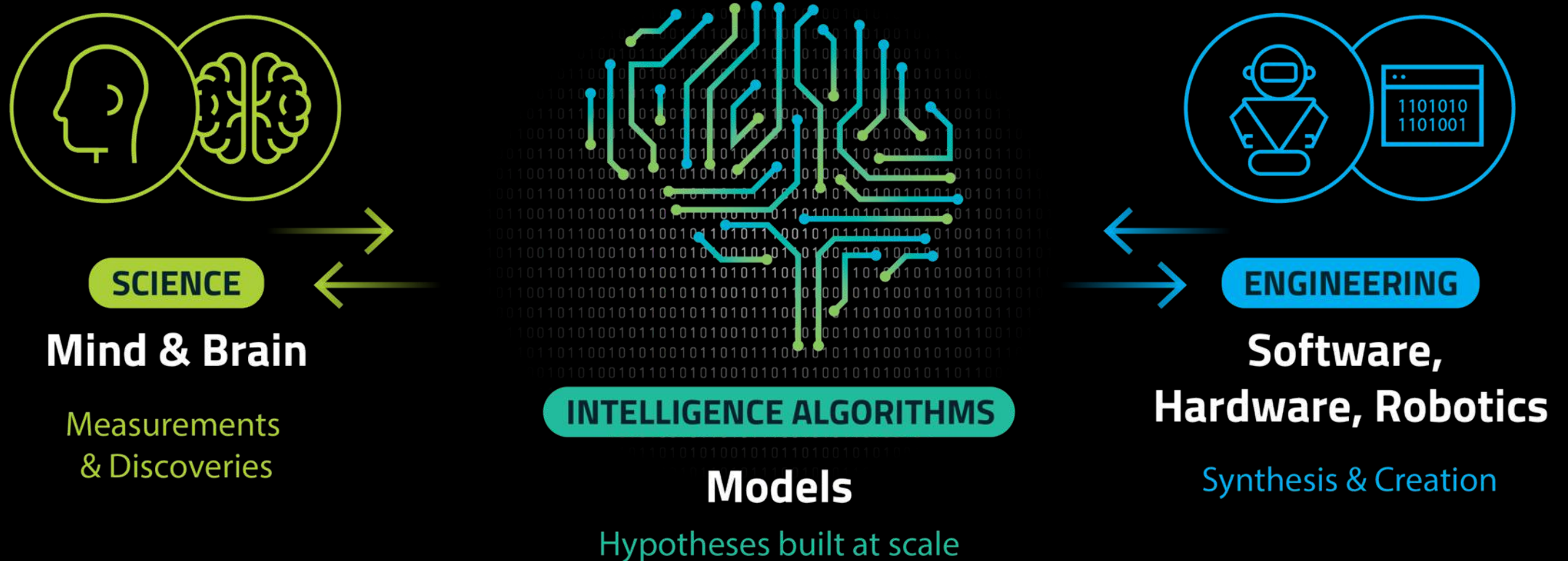
The mission of The Core is to reverse engineer intelligence. Intelligence — what it is, how the brain produces it, and how it can be engineered — is simultaneously **the greatest open question in the natural sciences** and **the most important engineering challenge of our time.**

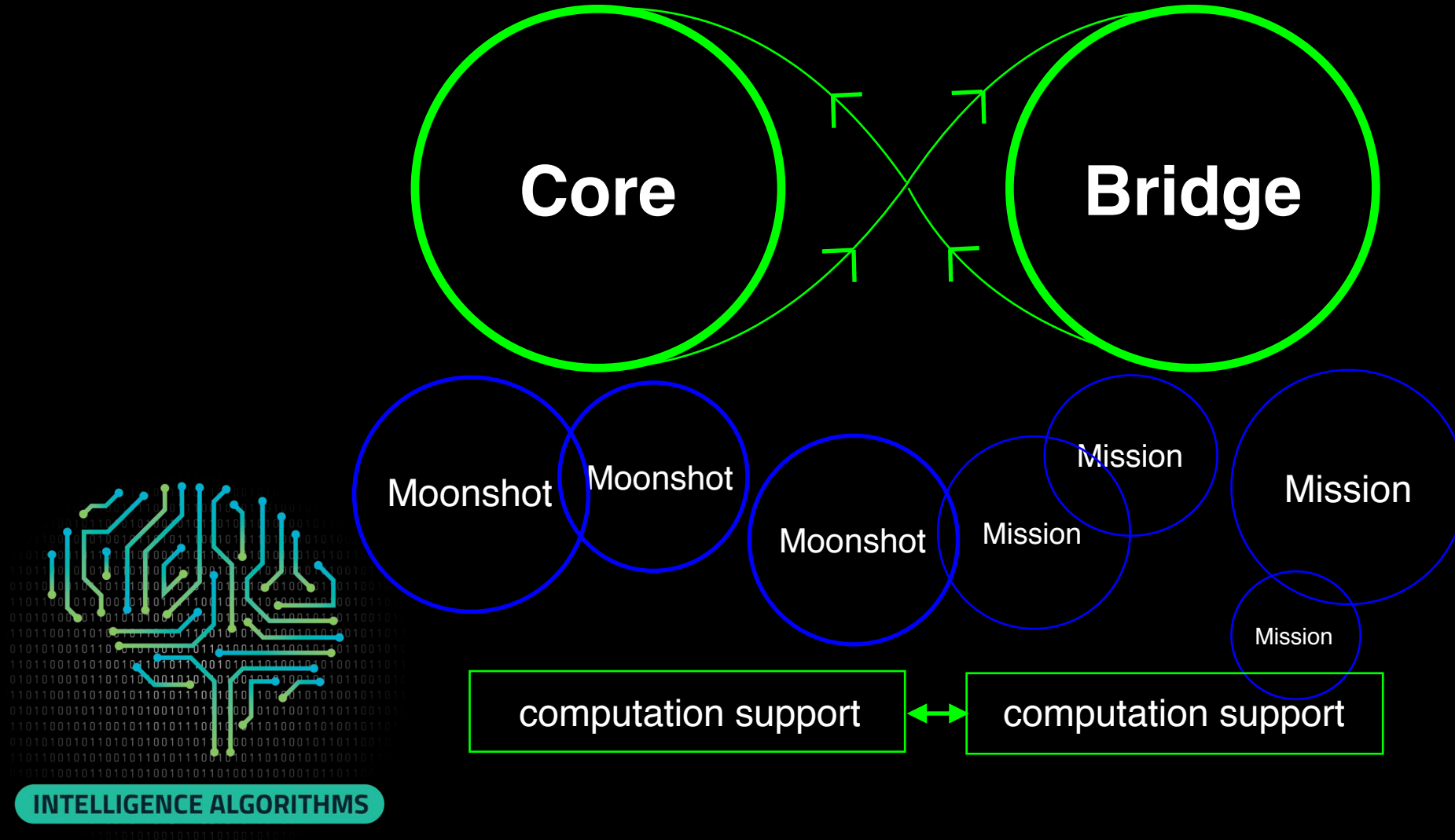
At MIT, we believe these challenges are interlocked aspects of **the same grand mission.**

By bringing together diverse teams to work at the **intersection** of science and engineering, we aim for breakthroughs in both human and artificial intelligence.

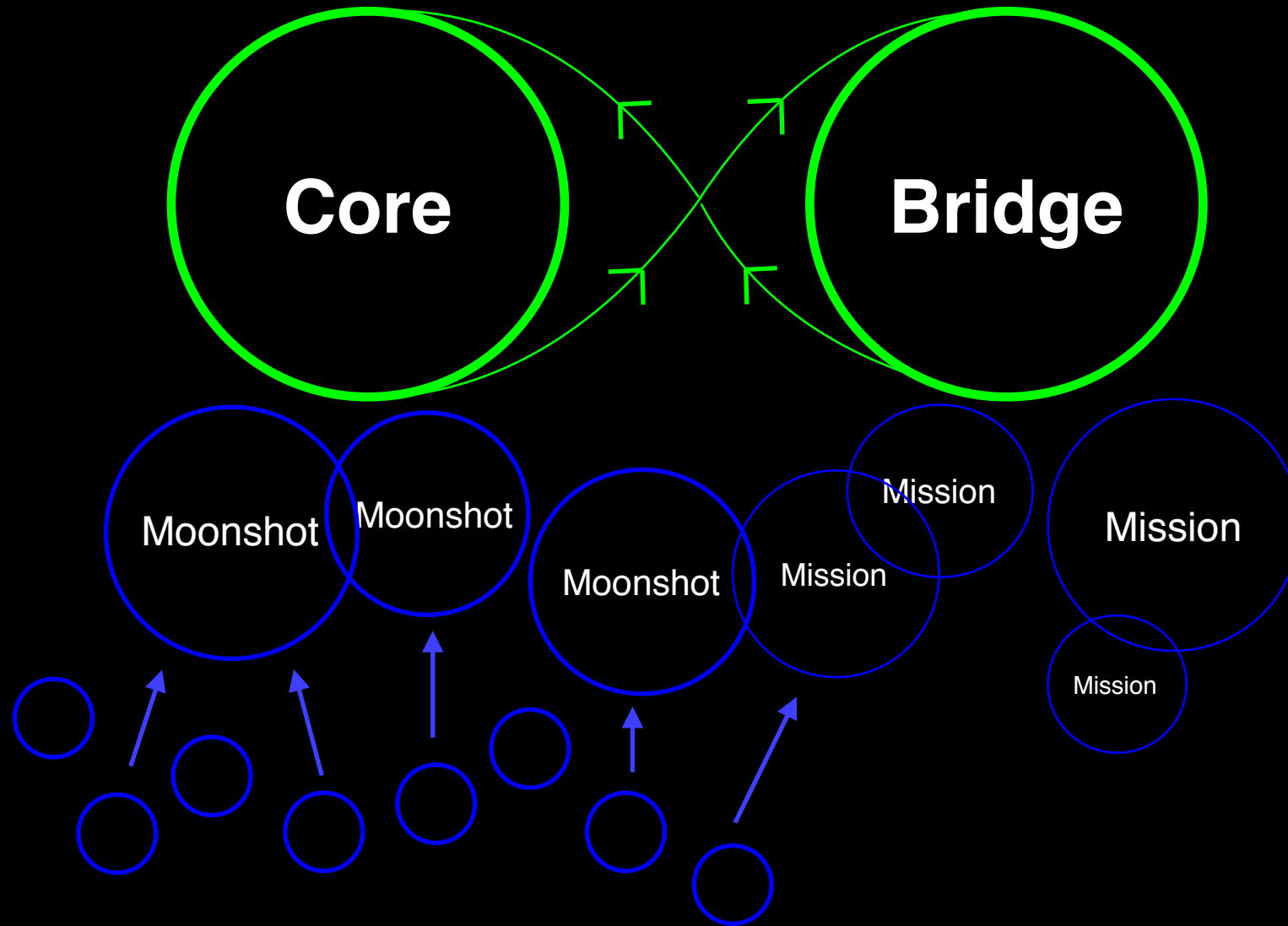
Vision for The Quest Core

THE CORE





“Expeditions”



What is a Quest Core Moonshot?

- Team-driven bet on a large, unsolved problem in intelligence
- Moonshot projects go above and beyond business as usual
 - Strive to answer some of the most complex and enduring questions about intelligence
- Projects that MIT is well positioned to lead
 - (relative to other universities and to industry players)
- Such projects will drive the future of The Core.



The Quest Bridge



Nicholas Roy | Director, The Quest Bridge

Cynthia Breazeal | Associate Director Strategic Initiatives The Quest Bridge

Current Issues and Challenges

- Lack of accessibility
- Lack of resources
- Lack of expertise in tools
- Lack of reproducibility

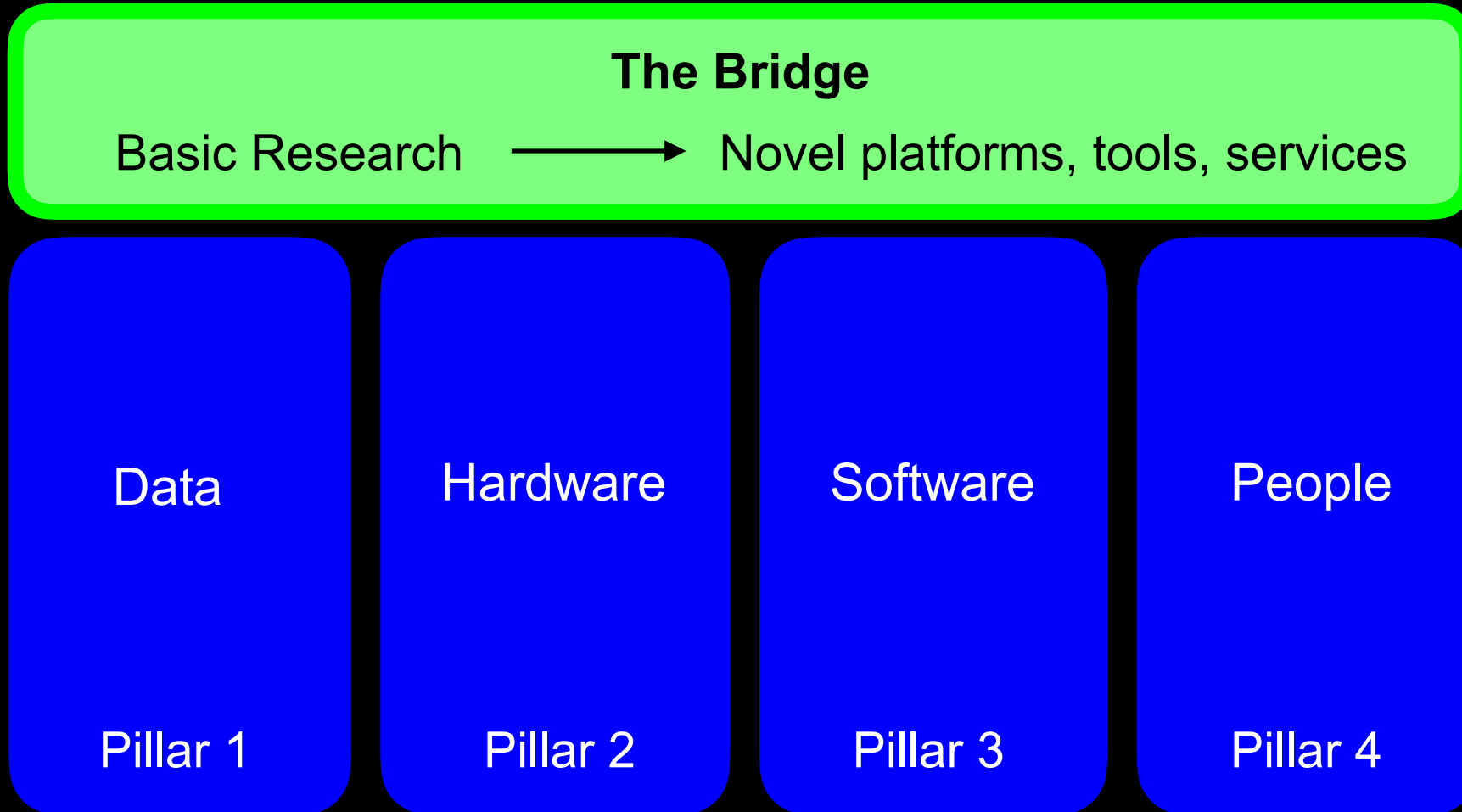


A photograph of a computer lab at MIT during the Project Athena initiative. Several students are seated at desks, working on early personal computers. The students are focused on their work, with some looking at the screens and others at papers. The computers have large, beige monitors and keyboards. The background shows more desks and students, creating a sense of a busy, collaborative learning environment.

Project Athena at MIT

Photo credit: MIT Infinite History

What is The Quest Bridge?



Quest Bridge Missions

- Projects that identify areas that could benefit from more intelligent systems and work to develop and deploy these systems ethically and transparently
- Work with The Quest Core to connect discoveries and insights to many other disciplines, from education, research, business and beyond

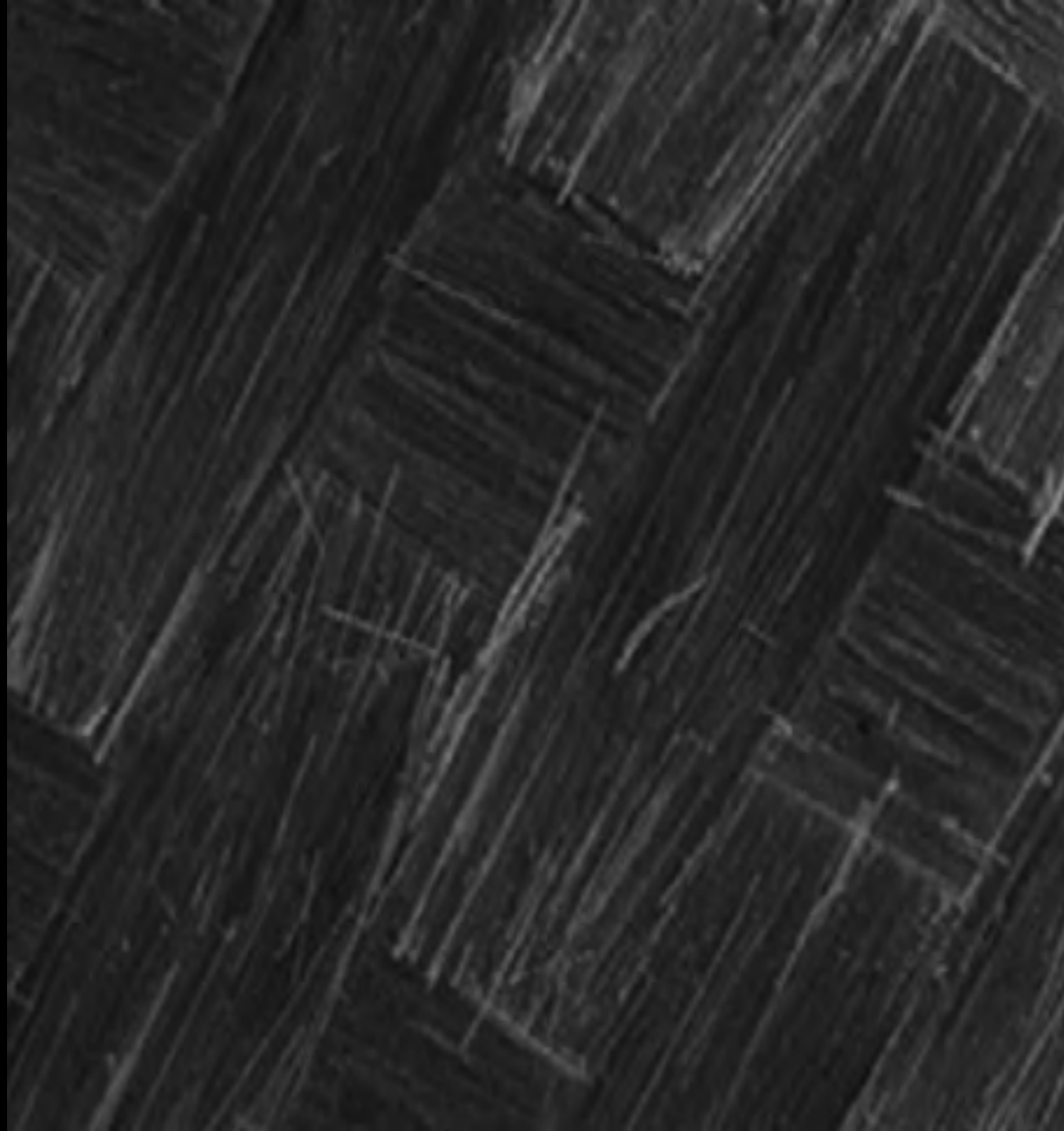
User Story #1

- Problem: A social science researcher that wants to extract entities and sentiments from a large batch of documents for analysis
- Solution: Use pre-existing AI tools



User Story #2

- Problem: A material scientist doesn't want to manually find and identify fractures in a carbon fibre laminate
- Solution: Train our own AI tools

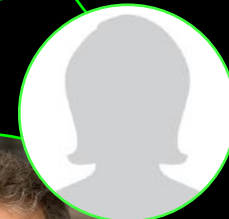


Bridge Resources

- 1M Google cloud credits
- IBM cloud resources
- 1.5 research scientists
- Actively hiring another full-time software engineer
- Training/education/tutorial sessions (Coming Soon!)
- A team of UROPs

The Quest **Core**

Visual Intelligence



Prof. Antonio Torralba

Director, Quest
Director MIT-IBM Watson AI Lab
Professor, EECS, CSAIL

Prof. Tomaso Poggio

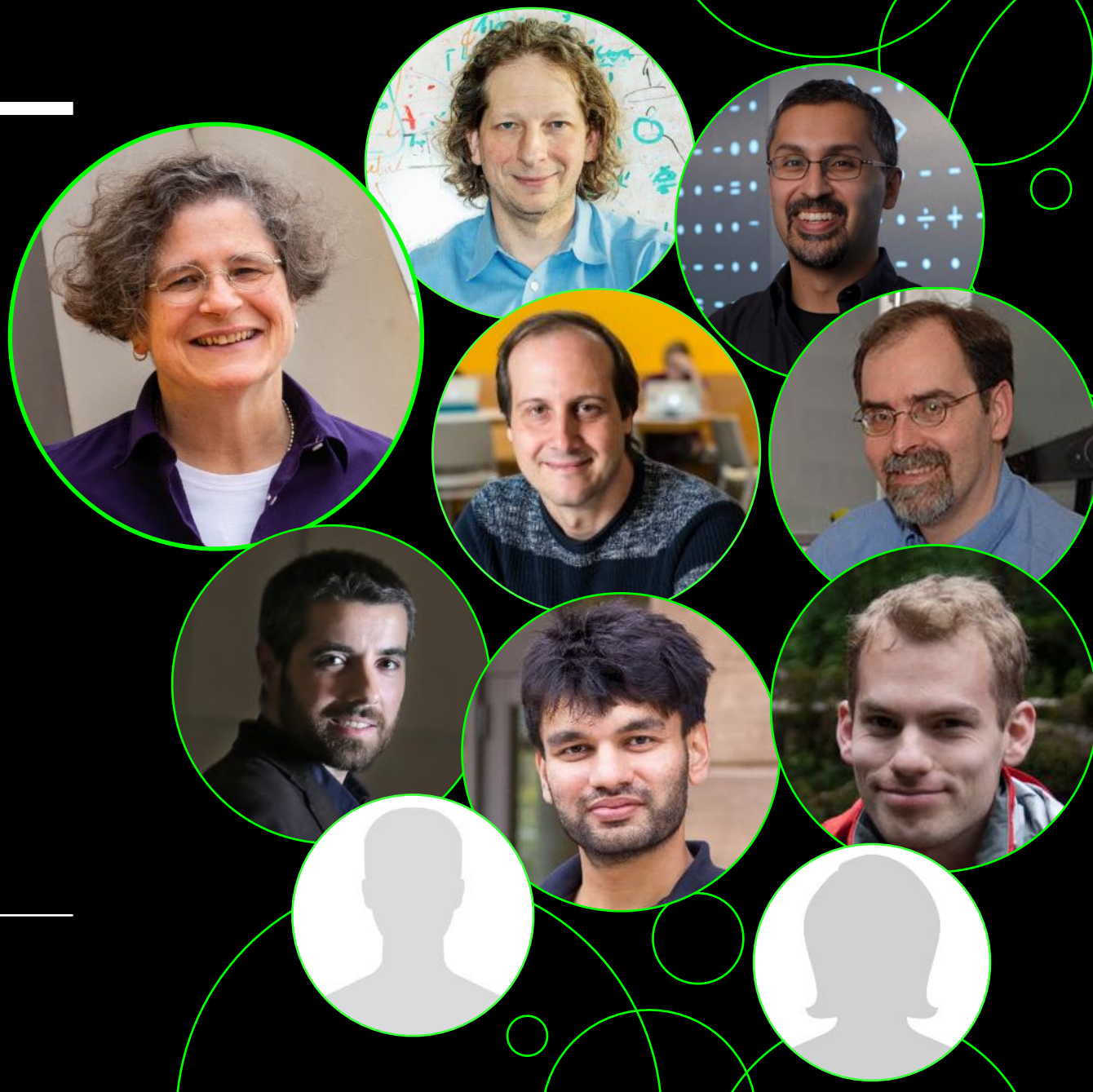
Director, Center for Brains, Minds and Machines
Founding Scientific Advisor, The Quest Core
Eugene McDermott Professor, BCS

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Embodied Intelligence

Prof. Leslie Kaelbling

Co-Scientific Director, The Quest Core
Panasonic Professor of Computer Science
and Engineering, EECS, CSAIL



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Growing Intelligence

Prof. Josh Tenenbaum

Co-Scientific Director, The Quest Core
Professor of Computational Cognitive Science
Dept. of Brain & Cognitive Sciences



The Quest Core

Collective Intelligence

Prof. Daniela Rus

Director, CSAIL

Associate Director, The Quest Core

Andrew (1956) and Erna Viterbi Professor
of Electrical Engineering, EECS



Prof. Thomas Malone

Founding Director, MIT Center for Collective Intelligence

Patrick J. McGovern Professor of Management
MIT Sloan School of Management



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Hardware for Machine Intelligence

Prof. Jesus del Alamo

Director, Microsystems Technology Laboratories
Donner Professor and Professor of Electrical
Engineering, EECS



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The Ethics of AI

Abby Jaques, PhD

Postdoctoral Associate

Dept. of Linguistics and Philosophy
MIT School of Humanities, Arts, and
Social Sciences



*The Quest **Bridge***

Democratizing AI Through Hands-on K-12 AI Education

Prof. Cynthia Breazeal

Associate Director of Strategic Initiatives, The Quest Bridge
Associate Professor of Media Arts and Sciences
MIT Media Lab
Founder & Chief Scientist of Jibo, Inc.

