THE KEMPNER INSTITUTE’S MISSION

To study intelligence, broadly speaking.

The fields of natural and artificial intelligence are intimately connected.
We seek to understand the basis of intelligence in natural and artificial systems

- **Foundations of intelligence**: mathematical and computational models of intelligence, cognitive theories of intelligence, computational neurobiology, and the neurobiological basis of intelligence.

- **Applications of artificial intelligence**: natural language processing, visual scene processing and analysis, mechanistic analysis of high dimensional neural and behavioral data from an engineering standpoint (e.g., development of new methodologies or advancing the state of the art) or a scientific one (e.g., achieving a better understanding of deep learning).
OUR COMMUNITY

Interfaculty initiative operating out of the Provost’s office.

Working with many schools to engage and add to the breadth of talent and expertise within the Harvard community.

Building a vibrant community with people from diverse backgrounds and perspectives to work across fields.

Committed to Open Science and making research funded by the Kempner Institute widely and easily available.

Bringing together the people, space and technology necessary to pursue cutting-edge research and support a generation of students.
Agenda

- Infrastructure  Space, Team
- Three Programmatic Components  Research, Education, Compute
- Getting involved
Agenda

- **Infrastructure**  Space, Team
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Space

6th Floor of the Science & Engineering Complex

- Opening early winter 2024
- 30,000 sqft of space

- Space for the Kempner community
  - 29 private and shared offices
  - 13 computation labs
  - 40+ open or assigned desks
  - 12 collaboration spaces
  - 10 conference rooms
Current team

Elise Porter
Executive Director

Ella Batty
Assistant Director of Education

Deborah Apsel Lang
Assistant Dir of Communications

Michaela Kapp
Assistant Director of Finance

Molly Marshall
Executive Assistant and Project Coordinator
Advisory Steering Committee

Boaz Barak
SEAS

Francesca Dominici
HSPH

Finale Doshi-Velez
SEAS

Catherine Dulac
FAS

Robert Gentleman,
HMS

Samuel Gershman
FAS

Isaac Kohane
HMS

Susan Murphy
FAS/SEAS

Venkatesh Murthy
FAS

Fernanda Viégas
SEAS

John Shaw
Vice Provost for Research

Willy Lensch
Associate Provost for Research
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Program Pillars

AY23 Initiatives

Research
- Institute Investigators (Core Faculty)
- Associate Faculty
- Affiliate Faculty
- Visiting Scientists
- Grants

Education
- Kempner Research Fellows (7/year)
- Grad. Student Fellowships (~20/year)
- Postbaccalaureate Program
- Undergraduates
- Educational programming

Compute
- GPU (~1000 GPUs)
- Senior Engineers
- Engineering Fellows
Institute Investigators (Core Faculty)

- **Recruiting 10 new faculty** in partnership with schools
  - **Variety of disciplines**: AI/ML, Applied Math, Statistics, Cognitive Psychology, Neuroscience, Biology, Physics
  - Mix of theoretical and experimental approaches
- Private office and lab space in the Kempner Institute space
- Access to Compute resources
- AY23 search: **HMS and Kempner**
- AY24 hope for searches: **SEAS, FAS and Kempner**
Associate Faculty

- Associate Faculty drawn from existing faculty at Harvard
  - Have a demonstrated record of research accomplishments that are aligned with the Kempner research mission
  - Deeply engaged and available to help build the Kempner community

- Benefits:
  - 3-year, renewable terms
  - Research support (for first term only)
  - Access to hoteling office space in the Kempner Institute
  - Access to Kempner compute and engineering team

AY23 faculty nominated by Kempner Steering Committee. Moving to open call for applications from Harvard faculty in AY24
AY23 Associate Faculty

Demba Ba (SEAS)
Talia Konkle (FAS)
Cengiz Pehlevan (SEAS)
Haim Sompolinsky (FAS)
Marinka Zitnik (HMS)
Affiliate Membership

- Drawn from Harvard community
- Simple application process via Kempner website

**Faculty Membership**
- Can request access to space
- Can request access to compute cluster
- Can volunteer to host and mentor students

**Student Membership**
- Can request access to space
- Can participate in educational activities
- Can volunteer to host and mentor students

Applications to open fall 2023
Future programs...

- **Visiting Scientists**
  - Pre-eminent leaders in their field, from a variety of disciplines
  - Hosted for 3-6 months
  - Space in the Kempner suite in the SEC
  - Expected to launch in AY24

- **Grants**
  - Will be internal to Harvard only
  - Specific guidelines and RFP to be developed
  - Hoping to issue call for applications spring/summer 2024
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Kempner Research Fellows

- Early-career scientists pursuing research projects with autonomy
  - Similar to Postdocs
  - Akin to the Harvard Society Junior Fellows
- Generous salary and research support
- Access to compute and shared office in the Kempner space
- 3-year fellowship
- Will recruit 6 to 8 fellows each year
- Next application cycle opening late fall 2023
Incoming Class of Kempner Research Fellows

David Brandfonbrener
Wilka Carvalho
Jennifer Hu
Naomi Saphra
Ilenna Jones
Andy Keller
Eran Malach
Binxu Wang
Kempner Graduate Fellowships

We will not be starting our own graduate program. **Fellowships** support graduate students doing research in alignment with our mission.

We will award graduate fellowships to ~10 **incoming** and ~10 **existing** (G1 or G2 at time of application) students each year. Incoming students are nominated by the graduate program. Existing students can self-nominate.

**Student Benefits**

- Full stipend, tuition, health insurance and health fees **up to G6**
- Ability to apply for professional development funds starting in year 2
- Connection to a Kempner Institute-affiliated mentor
- Access to compute, engineers, and space in the Kempner Institute suite in SEC
- Funding is tied to the **student** not to the mentor
Kempner Graduate Fellowships

Awarded Incoming Student Fellowships

- Biophysics (1)
- Applied Math-SEAS (1)
- Computer Science-SEAS (2)
- Program in Neuroscience (PiN) (2)
- Speech Hearing Bioscience & Technology (1)

Rising 2nd & 3rd Year Fellowship Applications

- Applied Mathematics
- Applied Physics
- Bioinformatics & Integrative Genomics
- Biological & Biomedical Sciences
- Biostatistics
- Chemistry & Chem Biology
- Computer Science
- Engineering Sciences
- Molecular & Cellular Biology
- Program in Neuroscience
- Organismic & Evolutionary Biology
- Physics
- Population Health Sciences
- Psychology
- Public policy
- Speech Hearing Bioscience & Technology
- Statistics

10 fellowships for rising students will be awarded in May 2023
Future Educational Programs

Undergraduate Research Program
- Will support research experience for enrolled Harvard undergrads
- Will provide academic year experience and a summer program
- Hoping to launch spring AY24 or fall AY25

Postbaccalaureate Training Program
- Targeting students from diverse backgrounds, not enrolled at Harvard
- Research and educational program to help students prepare for advanced degree
- Hoping to launch 2-year program in fall AY25

Educational Activities
- Developing bootcamps, seminars, speaker series on topics of interest for our community
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Compute

Building one of largest academic computing clusters in the world

- Steady state of 1000+ GPUs
- First shipment (144 GPUs) arrived Jan 2023
- Installed in the Mass Green High Performance Computing Center (MGHPCC) in Holyoke
- Partnering with FAS-Research Computing on equipment & support

Building a team of software engineers to support science & education

- Director of Engineering
- Will build a team of Senior Engineers (~5) and Engineering Fellows (10-12)
- Will work directly with Kempner scientists and students

Developing a fairshare policy for Kempner-affiliated faculty, fellows and students
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PLEASE JOIN OUR COMMUNITY!

harvard.edu/kempner-institute/

- We are building vibrant community:
  - Infrastructure is underway!
  - Research/Education/Compute

- Join our mailing list for news and updates
- Visit our website to learn more about our community
- Become an Affiliate
- Apply for opportunities

Scan QR code to join our mailing list
Questions?