

Lucy Chai

Email: lrchai@mit.edu

Website: <http://people.csail.mit.edu/lrchai/>

Github: <https://github.com/chail>

Google Scholar: <https://scholar.google.com/citations?hl=en&user=bunnQWQAAAAJ>

Research Interests: Image Synthesis, Generative Modeling, Computer Vision, Deep Learning

Education

Massachusetts Institute of Technology

Department of Electrical Engineering and Computer Science

Ph.D. Student, Computer Science & AI Laboratory (CSAIL)

Cambridge, MA

2018

University of Cambridge, Churchill College

Department of Engineering

Machine Learning, Speech and Language Technology, *MPhil with Distinction*

Thesis: Uncertainty Estimation in Bayesian Neural Networks
and Links to Interpretability

Cambridge, UK

2017 – 2018

University of Pennsylvania

School of Engineering and Applied Science

Bachelor of Science in Engineering, *Summa Cum Laude*

Majors: Computer Science, Bioengineering | Minor: Mathematics

Philadelphia, PA

2013 – 2017

Awards

Meta Research PhD Fellowship, 2022

Adobe Research Fellowship, 2021

NSF Graduate Research Fellowship, 2017-2022

Churchill Scholarship, 2017

Wolf-Hallac Award, UPenn, 2017

Herman P. Schwan Bioengineering Award, UPenn, 2017

Senior Design Award, UPenn, 2017

Biomedical Engineering Society Annual Meeting Outstanding Poster Award, 2016

Delaware Valley Engineers Week Undergraduate Student Paper Award Recipient, 2016

Pinkel Fund Award Recipient, UPenn, 2016

Manfred Altman Memorial Award, UPenn, 2015

Chemical Rubber Company Chemistry Award, UPenn, 2014

Dean's List, 2013-2017

Thomas J. Watson Memorial Scholarship, 2013-2017

Publications

Lucy Chai, Michaël Gharbi, Eli Shechtman, Phillip Isola, Richard Zhang. Any-resolution training for high-resolution image synthesis. ECCV 2022.

<https://arxiv.org/abs/2204.07156>

Jingwei Ma, **Lucy Chai**, Minyoung Huh, Tongzhou Wang, Ser-Nam Lim, Phillip Isola, Antonio Torralba. Totems: Physical Objects for Verifying Visual Integrity. ECCV 2022.

<https://arxiv.org/abs/2209.13032>

Lucy Chai, Jun-Yan Zhu, Eli Shechtman, Phillip Isola, Richard Zhang. Ensembling with deep generative views. CVPR 2021.

<http://arxiv.org/abs/2104.14551>

Lucy Chai, Jonas Wulff, Phillip Isola. Using latent space regression to analyze and leverage compositionality in GANs. ICLR 2021

<http://arxiv.org/abs/2103.10426>

Lucy Chai, David Bau, Ser-Nam Lim, Phillip Isola. What makes fake images detectable? Understanding properties that generalize. ECCV 2020.

<https://arxiv.org/pdf/2008.10588.pdf>

Ali Jahanian*, **Lucy Chai***, Phillip Isola. On the "steerability" of generative adversarial networks. ICLR 2020.

<https://arxiv.org/pdf/1907.07171.pdf>

Lucy R. Chai, Dale Zhou, Danielle S. Bassett. Evolution of semantic networks in biomedical texts. Journal of Complex Networks, 2019.

Henderson J. C., Gertner, A., Zarella, G., **Chai, L. R.**, Miller, K. Name and Face Matching. U.S. Patent number 10,963,677.

Jeffrey E. Eben, Trevor L. Vent, Chloe J. Choi, Sushmitha Yarrabothula, **Lucy Chai**, Margaret Nolan, Elizabeth Kobe, Raymond J. Acciavatti, Andrew D. A. Maidment. Development of a Next Generation Tomosynthesis System. SPIE Medical Imaging Conference, 2018.

Chai, L. R., Khambhati, A. N., Ciric, R., Moore, T., Gur, R. C., Gur, R. E., Satterthwaite, T. D., Bassett, D.S. Evolution of brain network dynamics in neurodevelopment. Network Neuroscience, 2017.

Chai, L. R., Mattar, M. G., Blank, I. A., Fedorenko, E., and Bassett, D. S. Functional network dynamics of the language system. Cerebral Cortex, 2016.

Presentations

Rethinking our Dataset Setup: Any-resolution Training and Totems for Single-image 3D Verification. Meta Reality Labs, 2023.

Using latent regression to probe compositionality in GANs. Presented at GenShop Adobe Research, 2021.

On the "steerability" of generative adversarial networks. Presented at New England Computer Vision Workshop, 2019.

Functional network dynamics of the language system

- Poster at Biomedical Engineering Society Annual Meeting, Tampa, FL, USA, 2015.
- Poster at Society for Neuroscience (SfN), Chicago, IL, USA, 2015.

Evolution of brain network dynamics in neurodevelopment

- Talk at Brain Behavior Laboratory Imaging Meeting, March 17, 2016.
- Poster at Biomedical Engineering Society Annual Meeting, 2016.

Work Experiences

Student Researcher @ Google, Summer 2022

New York, NY

- 3D image synthesis

Research Intern @ Adobe Research, Summer 2020, Summer 2021

Adobe, San Francisco, CA, 94103 (remote)

- Investigating GAN variations for image synthesis applications

Computer Vision Group @ CSAIL MIT, Research Assistant, 2018-present

Massachusetts Institute of Technology, Cambridge, MA, 02139

- Image manipulations via generative models, understanding generative models, image forensics

Machine Learning Group, Computational and Biological Learning Lab, 2018

Department of Engineering, University of Cambridge, Cambridge, UK

Project title: Uncertainty in Bayesian Neural Networks and Links to Interpretability

- Bayesian neural networks provide uncertainty estimates with model predictions. We investigate methods for interpretability in Bayesian neural networks – specifically how to visualize what regions of an input image make model predictions uncertain.

Complex Systems Group, Undergraduate Researcher, 2014-2017

Department of Bioengineering, University of Pennsylvania, Philadelphia, PA

- Functional network dynamics of the language network

- Model language processing regions of the brain as a graph, using statistical null models and network science algorithms to study temporal dynamics involved in understanding language.
- Evolution of brain network dynamics in neurodevelopment
 - Non-negative matrix factorization approach to study how brain structure flexibly adapts to enable increasing cognitive function through childhood and adolescence.
- Evolution of semantic networks in biomedical texts
 - The structure of scientific literature changes throughout the drafting and revision process. We use network analysis tools to study how these changes enable more efficient information transfer.
- Mentoring for undergraduate projects: Yueqi Ren (BSE 2019), Brooke Behrbaum (BSE 2019)

Data Science Intern, Summer 2017

MITRE, Bedford, MA

- Deep learning models for facial image to text matching

Software Developer Intern, Summer 2016

athenahealth, Watertown, MA

- Built an interactive web map for the athenahealth campus in the style of Google maps, with a custom map tile cutting utility and a fuzzy string comparison search feature to search up to desk-level granularity

Teaching Experiences

Teaching Assistant, Advances in Computer Vision, Spring 2021

Department of Electrical Engineering & Computer Science, MIT, Cambridge, MA

- Fundamentals and applications of computer vision and deep learning

Teaching Assistant for Prof. Aaron Roth, CIS 262, Fall 2016

Department of Computer Science, University of Pennsylvania, Philadelphia, PA

- Finite automata and regular languages, Turing machines, undecidability, tractability and NP-completeness

Teaching Assistant for Prof. Dan Huh, BE 350, Spring 2017

Department of Bioengineering, University of Pennsylvania, Philadelphia, PA

- Fluid mechanics, Navier Stokes equations, thermodynamics, and energy and mass transport