Lucy Chai

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Website: http://people.csail.mit.edu/lrchai/
Github: https://github.com/chail

Research Interests

Generative Modeling, Computer Vision, Deep Learning, Cognitive Science

Education

Massachusetts Institute of Technology — Cambridge, MA
Department of Electrical Engineering and Computer Science — 2018
Ph.D. Student, Computer Vision Group

University of Cambridge, Churchill College — Cambridge, UK
Department of Engineering — 2017 – 2018
Machine Learning, Speech and Language Technology, *MPhil with Distinction*
Thesis: Uncertainty Estimation in Bayesian Neural Networks
and Links to Interpretability

University of Pennsylvania — Philadelphia, PA
School of Engineering and Applied Science — 2013 – 2017
Bachelor of Science in Engineering, *Summa Cum Laude*
Majors: Computer Science, Bioengineering | Minor: Mathematics

Awards

Adobe Research Fellowship, 2021
NSF Graduate Research Fellowship, 2017-2022
Churchill Scholarship, 2017
Wolf-Hallac Award, 2017
Herman P. Schwan Bioengineering Award, 2017
Senior Design Award, 2017
Biomedical Engineering Society Annual Meeting Outstanding Poster Award, 2016
Delaware Valley Engineers Week Undergraduate Student Paper Award Recipient, 2016
Pinkel Fund Award Recipient, 2016
Manfred Altman Memorial Award, 2015
Chemical Rubber Company Chemistry Award, 2014
Dean's List, 2013-2017
Thomas J. Watson Memorial Scholarship, 2013-2017

Publications

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

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

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 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