

Arianna Xuefei Yuan

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RESEARCH INTERESTS Natural Language Processing, Visually Grounded Language Understanding, Reinforcement Learning, Meta-learning and Mathematical Cognition.

EDUCATION **Stanford University**, Stanford, CA, United States

Ph.D. Candidate in Cognitive Psychology and Computer Science. *Expected:* Aug. 2020;

Member of the Stanford NLP Group;

Trainee of the Stanford Mind, Brain, Computation and Technology Graduate Training Program.

- Relevant Courses: CS221 Artificial Intelligence. CS229 Machine Learning. CS224D Deep Learning for Natural Language Processing. CS224U Natural Language Understanding. CS234 Reinforcement Learning. CS231A Computer Vision, From 3D Reconstruction to Recognition. CS247 Human-Computer Interaction Design Studio. CS428 Computation and Cognition: the Probabilistic Approach. Psych209 Neural Network and Deep Learning Models for Cognition and Cognitive Neuroscience. Psych252 Statistical Methods for Behavioral and Social Sciences. STATS200 Statistical Inference. STATS217 Stochastic Process.
- Thesis Project: Multi-Modal Integration in Number Sense Acquisition. Advisor: Jay McClelland
- Cumulative GPA: 3.97/4.0

Peking University, Beijing, China

M.S., Cognitive Neuroscience, Jul. 2014

Tianjin University, Tianjin, China

B.S., Mathematics and Applied Mathematics, Jul. 2011

WORK EXPERIENCE Research Intern in Machine Perception and Human-Computer Interaction at **Google AI**, Mountain View, USA. Summer 2019
Research Intern in Machine Learning at **Microsoft Research**, Cambridge, UK. Summer 2017

PRESENTATIONS AND PUBLICATIONS **Arianna Yuan** and Yang Li. Modeling Human Visual Search Performance on Realistic Webpages Using Analytical and Deep Learning Methods. In *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI 2019)*.

Yuxian Meng, Xiaoya Li, Xiaofei Sun, Qinghong Han, **Arianna Yuan**, Jiwei Li. Is Word Segmentation Necessary for Deep Learning of Chinese Representations? In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL 2019)*.

Xiaoya Li, Fan Yin, Zijun Sun, Xiayu Li, **Arianna Yuan**, Duo Chai, Mingxin Zhou, Jiwei Li. Entity-Relation Extraction as Multi-turn Question Answering. In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL 2019)*.

Yuxian Meng, Xiangyuan Ren, Zijun Sun, Xiaoya Li, **Arianna Yuan**, Fei Wu, Jiwei Li (2019). Large-Scale Pretraining for Neural Machine Translation with Tens of Billions of Sentence Pairs. *arXiv preprint arXiv:1909.11861*.

Arianna Yuan, Jay McClelland (2019). Modeling Number Sense Acquisition in A Number Board Game by Coordinating Verbal, Visual, and Grounded Action Components. In *Proceedings of the 41th Annual Meeting of the Cognitive Science Society (CogSci 2019)*.

Sizhu Cheng*, **Arianna Yuan*** (2019). Understanding the Learning Effect of Approximate Arithmetic Training: What was Actually Learned? In *Proceedings of the 17th Annual Meeting of the International Conference on Cognitive Modeling (ICCM 2019)*.

Shengjia Zhao, Hongyu Ren, **Arianna Yuan**, Jiaming Song, Noah Goodman, Stefano Ermon (2018). Bias and Generalization in Deep Generative Models: An Empirical Study. **NeurIPS 2018**.

Arianna Yuan, Will Monroe, Yu Bai and Nate Kushman (2018). Understanding the Rational Speech Act Model. In *Proceedings of the 40th Annual Meeting of the Cognitive Science Society (CogSci 2018)*.

Arianna Yuan (2017). Domain-General Learning of Neural Network Models to Solve Analogy Tasks – A Large-Scale Simulation. In *Proceedings of the 39th Annual Meeting of the Cognitive Science*

Society (CogSci 2017).

Arianna Yuan and Michael Henry Tessler (2017). Generating Random Sequences For You: Modeling Subjective Randomness in Competitive Games. In *Proceedings of the 15th Annual Meeting of the International Conference on Cognitive Modeling (ICCM 2017)*.

Arianna Yuan, Te-Lin Wu, James L. McClelland (2016). Emergence of Euclidean geometrical intuitions in hierarchical generative models. Presented at *the 38th Annual Meeting of the Cognitive Science Society (CogSci 2016)*.

Arianna Yuan (2014). A Computational Investigation of the Optimal Task Difficulty in Perceptual Learning. Presented at *the 44th Annual Meeting of the Society for Neuroscience*, Washington, DC.

RESEARCH
PROJECTS

Modeling Human Behavior with Deep Learning, Research Internship at **Google AI, Mountain View**. Jun. 2019 – Sept. 2019

- We utilized state-of-the-art deep learning methods in computer vision to model human visual search on realistic webpages.
- Advisor: **Yang Li**.

Bias and Generalization in Deep Generative Models, Stanford University. NIPS 2018. Feb. 2018 – Jun. 2018

- We proposed a framework to systematically investigate the bias and the generalization in deep generative models of images, which allowed us to exactly characterize the learned distribution and study if/how the model generated novel features and novel combinations of existing features.
- Advisors: **Stefano Ermon** and **Noah Goodman**.

Building Machines that Learn Visual Concepts Like Humans, Stanford University. Jan. 2018 – Mar. 2018

- We built policy gradient networks to enable active learning and transfer learning in computer vision tasks.
- Advisor: **Emma Brunskill**.

Dialog Modeling, Research Internship at **Microsoft Research Cambridge, UK** May. 2017 – Aug. 2017

- We examined the role of pragmatic reasoning in neural dialog models in order to generate more context-sensitive visual dialogs.
- Advisors: **Nate Kushman** and **Alex Taylor**.

Domain-General Learning of Neural Network Models for Analogical Reasoning, Stanford University Dec. 2016 – Feb. 2017

- Using word representations and image representations learned from large-scale naturalistic corpora, we built domain-general neural network models that learn to solve analogy tasks in different modalities (texts and images).
- The model reproduced key findings in the analogical reasoning literature, including relational shift and familiarity effect.

Emergence of Euclidean Geometrical Intuitions in Hierarchical Generative Models, CS221 & CS229, Stanford University Sept. 2015 – Dec. 2015

- We built a deep autoencoder to reconstruct geometric figures and analyzed the representations of deep-belief networks by visualizing the response profiles of the hidden units.
 - Project Advisors: **Andrew Ng**, **Percy Liang** and **James McClelland**.
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AWARDS

Princeton University

Travel Award for the *Parallel Distributed Processing and the Emergence of an Understanding of Mind Symposium*

Stanford University

The School of Humanities and Sciences (H&S) Graduate Fellowship

SIGF: Stanford Interdisciplinary Graduate Fellowship

SKILLS

Python (proficient, including Tensorflow, Pytorch and NLTK), Javascript (proficient), Java, Torch, SQL, Scheme, Matlab, R, WebPPL, Github, GPU computing.
