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POSITIONS

2024 – current **UC Berkeley**, California, USA
Postdoctoral Associate (Visual Neuroscience)
Advisor: Doris Tsao

EDUCATION

2018 – 2023 **Stony Brook University**, New York, USA
Ph.D. Cognitive Science (Vision, Attention, Eye-movements)
Advisor: Gregory Zelinsky

2016 – 2018 **Seoul National University**, Seoul, Republic of Korea
M.A. Cognitive Science (Language, Eye-movements)
Advisor: Sungryong Koh

2011 – 2016 **Seoul National University**, Seoul, Republic of Korea
B.A. Psychology, B.A. Russian Language and Literature
Advisor: Sowon Hahn, Eunji Song

RESEARCH INTERESTS

- Using neuroscientific and psychophysical methods to understand the brain's stable and robust representations of the visual world.
- Using deep learning models to identify the computational mechanisms (e.g., attention) required for intelligent visual behaviors..
- Developing embodied models of visual cognition (e.g., with eye movements) to enhance interactivity between and interpretablitiy of human and computer vision.

GRANTS AND FELLOWSHIPS

2016 – 2018 Graduate Research Fellowship (2 yrs). Seoul National University
2011 – 2016 The Next Century Humanities Scholarship (4 yrs). Korean Student Aid Foundation

HONORS AND AWARDS

2023 APA Dissertation Research Award. American Psychological Association (APA)
2023 FoVea Travel and Networking Award. FoVea (Females of Vision, et al.)
2023 Distinguished Travel Award. Graduate Student Organization, Stony Brook University
2023 Endowed Award for Cognitive Science. Department of Psychology, Stony Brook University
2022 National Eye Institute Travel Award. Vision Sciences Society
2016 Undergraduate Best Student Paper. College of Social Sciences, Seoul National University

PEER-REVIEWED PUBLICATIONS

1. Yang, Z., Mondal, S., **Ahn, S.**, Xue, R., Zelinsky, G., Hoai, M., & Samaras, D. (in press). Unifying top-down and bottom-up scanpath prediction using Transformers. *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition (CVPR)*.
2. **Ahn, S.**, Adeli, H., & Zelinsky, G. (in press). The attentive reconstruction of objects facilitates robust object recognition. *PLOS Computational Biology*
3. Prasse, P., Reich, D. R., Makowski, S., **Ahn, S.**, Scheffer, T., & Jäger, L. A. (2023). SP-EyeGAN: Generating synthetic eye Movement data with Generative Adversarial Networks. *In Proceedings of the Symposium on Eye Tracking Research and Applications (ETRA)*, 1-9.
4. Adeli, H., **Ahn, S.**, & Zelinsky, G. J. (2023). A brain-inspired object-based attention network for multiobject recognition and visual reasoning. *Journal of Vision*, *23*(5), 1-17.
5. Mondal, S., Yang, Z., **Ahn, S.**, Samaras, D., Zelinsky, G., & Hoai, M. (2023). Gazeformer: Scalable, effective and fast prediction of goal-directed human attention. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 1441-1450.
6. Chakraborty, S., Wei, Z., Kelton, C., **Ahn, S.**, Balasubramanian, A., Zelinsky, G., & Samaras, D. (2023). Predicting visual attention in graphic design documents. *IEEE Transactions on Multimedia*, *25*, 4478-4493
7. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2022). Reconstruction-guided attention improves the robustness and shape processing of neural networks. *Advances in Neural Information Processing Systems Workshops (NeurIPS Workshops)*, 1-13.
8. Yang, Z., Mondal, S., **Ahn, S.**, Zelinsky, G., Hoai, M., & Samaras, D. (2022). Target-absent human attention. *In European Conference on Computer Vision (ECCV)*, 52-68.
9. Chen, Y., Yang, Z., Chakraborty, S., Mondal, S., **Ahn, S.**, Samaras, D., Hoai, M. & Zelinsky, G. (2022). Characterizing target-absent human attention. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPR Workshops)*, 5031-5040.
10. **Ahn, S.**, Zelinsky, G. J., & Lupyan, G. (2021). Use of superordinate labels yields more robust and human-like visual representations in convolutional neural networks. *Journal of Vision*, *21*(13), 1-19.
11. Chen, Y., Yang, Z., **Ahn, S.**, Samaras, D., Hoai, M., & Zelinsky, G. (2021). Coco-search18 fixation dataset for predicting goal-directed attention control. *Scientific reports*, 11(1), 8776.
12. Zelinsky, G., Chen, Y., **Ahn, S.**, Adeli, H., Yang, Z., Huang, L., Samaras, D., & Hoai, M. (2021). Predicting goal-directed attention control using inverse-reinforcement learning. *Neurons, behavior, data analysis and theory*, *5*(2), 1-9
13. **Ahn, S.**, Kelton, C., Balasubramanian, A., & Zelinsky, G. (2020). Towards predicting reading comprehension from gaze behavior. *In Proceedings of the ACM Symposium on Eye Tracking Research & Applications (ETRA)*, *32*, 1-5.
14. Yang, Z., Huang, L., Chen, Y., Wei, Z., **Ahn, S.**, Zelinsky, G., Samaras, D., & Hoai, M. (2020). Predicting goal-directed human attention using inverse reinforcement learning. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 193-202.
15. Zelinsky, G., Yang, Z., Huang, L., Chen, Y., **Ahn, S.**, Wei, Z., Adeli, H., Samaras, D., & Hoai, M. (2019). Benchmarking gaze prediction for categorical visual search. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPR Workshops)*, 1-9.

16. Kelton, C., Wei, Z., **Ahn, S.**, Balasubramanian, A., Das, S., Samaras, D., & Zelinsky G. (2019). Reading detection in real-time. *In Proceedings of the ACM Symposium on Eye Tracking Research & Applications (ETRA)*, 1-5.

BOOK CHAPTERS

1. Zelinsky, G. J., Chen, Y., **Ahn, S.**, & Adeli, H. (2020). Changing perspectives on goal-directed attention control: The past, present, and future of modeling fixations during visual search. *In Psychology of learning and motivation* (Vol. 73, pp. 231-286). Academic Press.

PRESENTATIONS

Symposia Chaired

1. Adeli, H., **Ahn, S.**, & Zelinsky, G. (2024). *Using deep networks to re-imagine object-based attention and perception*. Annual Meeting of Vision Science Society (VSS), St. Pete Beach, FL, USA.

Conference Talks

1. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2024). *A Generative approach to understanding categorical visual search*. Computational and Mathematical Models in Vision (MODVIS), St. Pete Beach, FL, USA.
2. Adeli, H., **Ahn, S.**, Zelinsky, G., & Kriegeskorte, N. (2024). *Object-based association fields for grouping and attention*. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.
3. Raina, R., **Ahn, S.**, & Zelinsky, G., *Generating objects in peripheral vision using attention-guided diffusion models*. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.
4. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2023). *Reconstruction-guided attention improves object recognition robustness of neural networks*. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.
5. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2022). *Reconstruction-as-feedback serves as an effective attention mechanism for object recognition and grouping*. Computational and Mathematical Models in Vision (MODVIS), St. Pete Beach, FL, USA.
6. Adeli, H., **Ahn, S.**, & Zelinsky, G. (2022). *A brain-inspired object-based attention network for multi-object recognition and visual reasoning*. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.
7. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2022). *Reconstruction-as-feedback serves as an effective attention mechanism to increase recognition robustness*. From Neuroscience to Artificially Intelligent Systems (NAISys). Cold Spring Harbor Laboratory, NY, USA.
8. Adeli, H., **Ahn, S.**, & Zelinsky, G. (2022). *A brain-inspired object-based attention network for multi-object recognition and visual reasoning*. From Neuroscience to Artificially Intelligent Systems (NAISys). Cold Spring Harbor Laboratory, NY, USA.
9. **Ahn, S.**, Zelinsky, G., & Lupyan, G. (2020). *Exploring the effects of linguistic labels on learned visual representations using convolutional neural networks*. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.

Invited Talks

1. **Ahn, S.** (2023). *Generating object-based attention through reconstruction*. Center for Neuroscience Imaging Research (CNIR) Seminar. Sungkyunkwan University, Seoul, Republic of Korea.

2. **Ahn, S.** (2023). *Generating object-based attention through reconstruction*. Neuro Vision Lab Seminar. University of California, Berkeley, CA, USA.

3. **Ahn, S.** (2023). *Generating object-based attention through reconstruction*. Visual Inference Lab Seminar. Columbia University, NY, USA.

Selected Posters

1. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2024). *Are search templates target-object reconstructions*. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.

2. Adeli, H., **Ahn, S.**, Kriegeskorte, N., & Zelinsky, G. (2023). *Self-supervised transformers predict dynamics of object-based attention in humans*. Conference on Cognitive Computational Neuroscience (CCN). Oxford, UK.

3. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2023). *Using generated object reconstructions to study object-based attention*. Conference on Cognitive Computational Neuroscience (CCN). Oxford, UK.

4. Adeli, H., **Ahn, S.**, Kriegeskorte, N., & Zelinsky, G. (2023). *Modeling the dynamics of spreading attention in objects: Do transformers behave like humans?* Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.

5. Zelinsky, G., **Ahn, S.**, Yang, Z., Chen, Y., Mondal, S., Hoai, M., & Samaras, D. (2023). *Reward maps predict target-present and target-absent visual search*. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.

6. **Ahn, S.**, Mondal, S., Yang, Z., Samaras, D., Zelinsky, G., & Hoai, M. (2023). *RefCOCO-Gaze: A Large-Scale Gaze Dataset for an Object Referral Task*. Workshop on Natural Environments Tasks and Intelligence. Center for perceptual Systems, University of Texas at Austin, TX, USA.

7. Adeli, H., **Ahn, S.**, & Zelinsky, G. (2022). *Sequential object-based attention for robust visual reasoning*. Conference on Cognitive Computational Neuroscience (CCN). San Francisco, CA, USA.

8. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2022). *Using object reconstruction as top-down attentional feedback yields a shape bias and robustness in object recognition*. Conference on Cognitive Computational Neuroscience (CCN). San Francisco, CA, USA.

9. **Ahn, S.**, Adeli, H., & Zelinsky, G. (2022). *Using object reconstruction as a dynamic attention window to improve recognition robustness*. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.

10. **Ahn, S.**, & Zelinsky, G. (2019). Predicting mental states from eye movements during reading. Annual Meeting of Vision Science Society (VSS). St. Pete Beach, FL, USA.

TEACHING AND MENTORING EXPERIENCE

2020 Fall	Lab Instructor, Statistics, Stony Brook University
2020 Summer	Lab Instructor, Research and Writing, Stony Brook University
2020 Spring	Instructor, Research and Writing, Stony Brook University
2019 Fall	Guest Lecturer, Survey in Cognition and Perception, Stony Brook University

Research Assistants Supervised

	Name and Institution	Current Position
2023 – present	Khanna Shaltiel, Stony Brook University	Research Intern, NVIDIA
2023 – present	Yining Xue, Stony Brook University	M.S student, Washington University in St.Louis
2023 – present	Jiaxin Xie, Stony Brook University	*Continuing undergraduate studies*
2023 – present	Ezzah Asad, Stony Brook University	*Continuing undergraduate studies*
2023 – present	Garrett Norris, Stony Brook University	*Continuing undergraduate studies*
2023	Dominick Fiumano, Stony Brook University	Research Intern, Suffolk County Department of Health
2023	Cherry Jiang, Stony Brook University	*Continuing undergraduate studies*
2022 – 2023	Lillian Macguire, Stony Brook University	M.S. student in Information Experience Design at Pratt Institute
2022 – 2023	Allison Liu, Stony Brook University	*Continuing undergraduate studies*
2022 – 2023	Sandy Xia, Stony Brook University	*Continuing undergraduate studies*
2022	Karla Orellana, Stony Brook University	M.A. student in Counseling, Stony Brook University
2022	Alena Koshy, Stony Brook University	*Continuing undergraduate studies*
2020 – 2021	Hannah Leibowitz, Stony Brook University	*Continuing undergraduate studies*
2020 – 2021	Sidrah Durrani, Stony Brook University	M.A. student in Developmental Psychology program, Teachers College, Columbia University
2020 – 2021	Joshua Kartzman, Stony Brook University	M.S. student in Applied Mathematics and Statistics program, Stony Brook University
2019 – 2020	Jacqueline Ho, Stony Brook University	M.S. student in Human-Computer Interaction (HCI) program, University of Maryland
2019 – 2020	Zifan Qiu, Stony Brook University	Peer Health Educator, Stony Brook University
2019 – 2020	Anna Kepley, Stony Brook University	M.A. student in Psychology, Queens College
2019	Katie Law, Stony Brook University	M.S. student, SUNY College of Optometry

EDITORIAL EXPERIENCE

Ad-Hoc Reviewer

Nature Communications; Journal of Experimental Psychology: Human Perception and Performance; PLOS ONE; Asian Conference on Computer Vision (ACCV); European Conference on Computer Vision (ECCV); International Conference on Computer Vision (ICCV);

Program Committee Member

1. Workshop on Eye Tracking in Learning and Education at ETRA, 2023

2. Workshop on All Things Attention: Bridging Different Perspectives on Attention at Neurips, 2022
3. Workshop on Gaze Estimation and Prediction in the Wild at CVPR, 2022
4. Workshop on Eye Tracking in Learning and Education at ETRA, 2022

DEPARTMENTAL SERVICE

Stony Brook University

1. Organizer, Workshop on programming for data analysis and visualization at GWISE (Graduate Women in Science and Engineering at Stony Brook University), 2022
2. Organizer, Workshop on eyetracking and data analysis for undergraduate students, 2021
3. Presenter, Psychology Undergraduate Research Fair, 2023

Seoul National University

1. Director, Producer, Actor, Russian Theater Club, 2011 – 2013
2. Contents Writer, Human Rights Center, 2012 – 2014
3. Leader, Women Society Club, 2012 – 2014

SKILLS

Deep Learning	Pytorch, Tensorflow, Keras
Programming	Proficient in Python, MATLAB; Familiar with Java, HTML
Statistics	R (lme4), SPSS, Mplus
Psychophysics	E-Prime, Psychopy, Psychojs
Eye Tracking	Eyelink, Webgazer.js
Other	Proficient in Russian; Trained in classical ballet