

CURRICULUM VITAE

HOJIN JANG

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▪ EDUCATION AND ACADEMIC APPOINTMENTS

Mar. 2024 – Present	Assistant Professor in Brain and Cognitive Engineering	Korea University, South Korea
Mar. 2024 – Present	Research Affiliate in Brain and Cognitive Sciences	Massachusetts Institute of Technology, United States Advisor: Prof. Pawan Sinha
Sep. 2022 – Feb. 2024	Postdoctoral Researcher in Brain and Cognitive Sciences	Massachusetts Institute of Technology, United States Advisors: Prof. Pawan Sinha & Dr. Xavier Boix
Sep. 2021 – Aug. 2022	Postdoctoral Researcher in Psychology	Vanderbilt University, United States Advisor: Prof. Frank Tong
Sep. 2016 – Aug. 2021	Ph.D. in Psychology	Vanderbilt University, United States Advisor: Prof. Frank Tong
Sep. 2014 – Aug. 2016	M.E. in Brain and Cognitive Engineering	Korea University, South Korea Advisor: Prof. Jong-Hwan Lee
Mar. 2008 – Aug. 2014	B.Sc. in Computer Science	Korea University, South Korea Advisor: Prof. Hee-Jo Lee

▪ PUBLICATIONS

Jang, H., & Boix, X. (*in preparation*). Robust visual recognition in varied viewing conditions with neural networks: The role of configural features.

Arslan, S.*, Fux, M.*, **Jang, H.***, Cooper A., Groth M., & Sinha, P. (*in preparation*). Comparing humans and deep neural networks on face recognition under various distance and rotation viewing conditions. (***Joint First Author**).

Jang, H., & Tong, F. (*in preparation*). Comparing the learning abilities of humans and neural networks at recognizing degraded objects at the threshold of visibility.

Jang, H., & Tong, F. (*in preparation*). Convolutional neural networks optimized for face recognition reveal a computational basis for holistic face processing.

Jang, H., Tong, F. (2024). Improved modeling of human vision by incorporating robustness to blur in convolutional neural networks. *Nature Communications*, 15, 1989. <https://doi.org/10.1038/s41467-024-45679-0>

Jang, H.*, Zaidi, S. S. A.*, Boix, X.*, Prasad, N.*, Gilad-Gutnick, S., Ben-Ami, S., & Sinha, P. (2023). Robustness to Transformations Across Categories: Is Robustness Driven by Invariant Neural Representations?. *Neural Computation*, 35(12), 1910-1937. (***Joint First Author**).

Jang, H., & Tong, F. (2021). Convolutional neural networks trained with a developmental sequence of blurry to clear images reveal core differences between face and object processing. *Journal of vision*, 21(12), 6-6.

Jang, H., McCormack, D., & Tong, F. (2021). Noise-trained deep neural networks effectively predict human vision and its neural responses to challenging images. *PLoS biology*, 19(12), e3001418.

Kim, H. C.*, **Jang, H.***, & Lee, J. H. (2020). Test–retest reliability of spatial patterns from resting-state functional MRI using the restricted Boltzmann machine and hierarchically organized spatial patterns from the deep belief network. *Journal of Neuroscience Methods*, 330, 108451. (***Joint First Author**).

Rane, S., Jolly, E., Park, A., **Jang, H.**, & Craddock, C. (2017). Developing predictive imaging biomarkers using whole-brain classifiers: Application to the ABIDE I dataset. *Research Ideas and Outcomes*, 3, e12733.

Jang, H., Plis, S. M., Calhoun, V. D., & Lee, J. H. (2017). Task-specific feature extraction and classification of fMRI volumes using a deep neural network initialized with a deep belief network: Evaluation using sensorimotor tasks. *Neuroimage*, 145, 314-328.

▪ **CONFERENCE ORAL PRESENTATIONS**

Jang, H., & Tong, F. (2022, May). Lack of experience with blurry visual input may cause CNNs to deviate from biological visual systems [Oral presentation]. Vision Sciences Society, St. Pete Beach, Florida, United States.

Jang, H., & Tong, F. (2020, May). Do noise-trained DNNs process noisy visual images in a more human-like manner? [Oral presentation]. Vision Sciences Society, Virtual Meeting.

Jang, H., & Tong, F. (2018, May). Can deep learning networks acquire the robustness of human recognition when faced with objects in visual noise? [Oral presentation]. Vision Sciences Society, St. Pete Beach, Florida, United States.

Jang, H., & Lee, J. H. (2016, May). Reproducibility and hierarchical organization of extracted weight features from resting fMRI using deep belief network [Oral presentation]. Korean Society for Cognitive Science, South Korea.

▪ **CONFERENCE POSTER PRESENTATIONS**

Jang, H., & Tong, F. (2023, May). A study of humans and convolutional neural networks on how to recognize blurry objects at the threshold of visibility [Poster presentation]. Vision Sciences Society, St. Pete Beach, Florida, United States.

Frey, G. H., Jang, H., Miao H., Tong, F. (2023, May). The role of scene context in object recognition by humans and convolutional neural networks [Poster presentation]. Vision Sciences Society, St. Pete Beach, Florida, United States.

Fux, M., Arslan, S., Jang, H., Cooper A., Groth M., & Sinha, P. (2023, May). Comparing humans and deep neural networks on face recognition under various distance and rotation viewing conditions [Poster presentation]. Vision Sciences Society, St. Pete Beach, Florida, United States.

Tong, F., & Jang, H. (2022, May). Convolutional neural networks optimized for face recognition reveal a computational basis for holistic face processing [Poster presentation]. Vision Sciences Society, St. Pete Beach, Florida, United States.

Jang, H., & Tong, F. (2021, May). Is initial training with blurry images beneficial for the development of object recognition systems? [Poster presentation]. Vision Sciences Society, Virtual Meeting.

Jang, H., & Tong, F. (2021, May). Different generalization capabilities of face and object processing in a developmental sequence of blurry to clear images [Poster presentation]. International Conference on Learning Representations Workshop, Virtual Meeting.

Jang, H., & Tong, F. (2019, May). Visual crowding disrupts the cortical representation of letters in early visual areas [Poster presentation]. Vision Sciences Society, St. Pete Beach, Florida, United States.

Jang, H., & Tong, F. (2017, September). Failure of deep networks at recognizing objects in visual noise: Comparisons with human behavioral performance [Poster presentation]. Cognitive Computational Neuroscience, New York, United States.

Jang, H., McCormack, D., & Tong, F. (2017, May). Evaluating the robustness of object recognition to visual noise in humans and convolutional neural networks [Poster presentation]. Vision Sciences Society, St. Pete Beach, Florida, United States.

Jang, H., & Lee, J. H. (2016, June). Reproducibility and hierarchy of weight features from resting fMRI using deep belief network [Poster presentation]. Pattern Recognition in Neuroimaging, Trento, Italy.

Jang, H., & Lee, J. H. (2016, June). Deep neural network for age prediction using resting-state fMRI data [Poster presentation]. Organization for Human Brain Mapping, Geneva, Switzerland.

Jang, H., & Lee, J. H. (2016, February). Functional connectivity-based age prediction using deep neural network [Poster presentation]. Brain and Artificial Intelligence Symposium, Brain Engineering Society of Korea, South Korea.

▪ PATENTS

Tong, F., & Jang, H. (2021). Noise-robust neural networks and methods thereof (U.S. Patent No. 11,030,487). U.S. Patent and Trademark Office.

▪ AWARDS AND HONORS

May. 2022 Jum Nunnally Dissertation Award, Department of Psychology, Vanderbilt University, United States
May. 2018 Graduate Student Travel Grant, Vanderbilt University, United States
July. 2012 Best Honors Scholarship, Korea University, South Korea

▪ RESEARCH EXPERIENCES & EXTRA-CURRICULAR ACTIVITIES

Mar. 2014 – Jul. 2014 Mind Brain Laboratory, Korea University, South Korea
Sep. 2013 – Dec. 2013 Korea University Buddy Assistant Club, Korea University, South Korea
Jul. 2013 – Aug. 2013 Neurodegeneration Control Research Center, Kyung-Hee University, South Korea
May. 2013 – Jul. 2013 English Academic School, Vancouver, Canada
Jan. 2013 – Apr. 2013 Exchange Student Program, Laval University, Quebec, Canada
Dec. 2011 – May. 2012 Global Leadership Center, Korea University, South Korea
Jul. 2009 – May. 2011 Military Service, Fire Direction Center, 36th Artillery Division of Army, South Korea
Sep. 2008 – Dec. 2008 Volunteer Teaching Program, Margaret Church, South Korea
Mar. 2008 – Dec. 2013 Korea WEB Club, Korea University, South Korea
Mar. 2008 – Dec. 2008 Korea University Institute of Computer Security Club, Korea University, South Korea

▪ TECHNICAL SKILLS

Programming languages: C, C++, C#, JAVA, MATLAB, Python, Assembly, HTML, CSS, PHP, JavaScript
Deep learning frameworks: PyTorch, TensorFlow, Keras, Theano
Neuroimaging software toolboxes: FSL, Freesurfer, SPM, Psychtoolbox