JEA KWON (JAY) Postdoc at Max Planck Institute for Security and Privacy

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EDUCATION	**Ph.D. in Nano-Bio-Information-Technology**	
	Korea University, Korea	2014.03 - 2022.02
	◇ Advisor : C. Justin Lee & Co-advisor : Sukwon Hwang	
	B.E. in Electrical and Electronic System	
	Saitama University, Japan	2008.04 - 2012.03
POSITIONS	**Max Planck Institute (MPI)**, Bochum, Germany	
	Postdoctoral Researcher, MPI for Security and Privacy	2024.11 - present
	Institute for Basic Science (IBS), Daejeon, Korea	
	Postdoctoral Researcher, Center for Cognition and Sociality	2022.01 - 2024.09
	Researcher, Center for Cognition and Sociality	2018.12 - 2020.11
	Korea Institute of Science and Technology (KIST), Seoul, Korea	
	Student Researcher, Center for Functional Connectomics	2014.03 - 2018.11

PUBLICATION SUMMARY

Citations
- Citations : 600+, h-index=9, i10-index=9

In Conferences, 1 main track, 5 workshop (-w)
- First author : *ICLR2024a-w, ICLR2024b-w, NeurIPS2023, CVPR2023-w, NeurIPS2022-w*
- Co-author : *CVPR2022-w*

In Journals, 16 SCI(E)
- First author : *IJCV2024, EN2024, Mol.Brain2021, EN2018, EN2017*
- Co-author : *Nat.Commun.2024, Nat.Metab.2023, Brain2023, Mol.Brain2022, CellMetab.2022, EN2022, EN2021a, EN2021b, J.Neurosci2020, Curr.Biol.2019, EN2019, PNAS2018, Nat.Commun.2016*

PUBLICATIONS

✓ : Selected Publication, * : First Author, † : Corresponding Author

Kang H*, Han A*, Zhang A*, Heejin Jeong, Wuhyun Koh, Jung Moo Lee, Hayeon Lee, Hee Jo Y, Maria-Solano MA, Bhalla M, **Kwon J**, Roh WS, Yang J, An HJ, Choi S, Kim HM† and Lee CJ† (2024). GolpHCat (TMEM87A), a unique voltage-dependent cation channel in Golgi apparatus, contributes to Golgi-pH maintenance and hippocampus-dependent memory. *Nature Communications*.
https://doi.org/10.1038/s41467-024-49297-8.

✓ **Kwon J***, Kim S*, Kim DK, Joo J, Kim S, Cha M† and Lee CJ† (2024). SUBTLE : An unsupervised platform with temporal link embedding that maps animal behavior. *International Journal of Computer Vision*. (IF=19.5)
https://doi.org/10.1007/s11263-024-02072-0.

✓ **Kwon J***, Sa M*, Kim H*, Seong Y and Lee CJ† (2024).Egocentric 3D Skeleton Learning in a Deep Neural Network Encodes Obese-like Motion Representations. *Experimental Neurobiology*. (Featured on the cover)
https://doi.org/10.5607/en24008.

Kwon J*, Sa M*, Kim H, Seong Y and Lee CJ† (2024). Egocentric 3D Skeleton Learning in Identity-Aware Deep LSTM Network Encodes Obese-Like Motion Representations. *ICLR 2024 workshop in TS4H*.
https://openreview.net/forum?id=x5hPDZqNBd.

✓ **Kwon J***, Song KW† and Lee CJ† (2024). Brain-inspired L_p-Convolution benefits large kernels and aligns better with visual cortex. *ICLR 2024 workshop in Re-Align*.
https://openreview.net/forum?id=WpFCplXaLv.

✓ Kim DK*, **Kwon J***, Cha M† and Lee CJ† (2023). Transformer as a hippocampal memory consolidation model based on NMDAR-inspired nonlinearity. *Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS)*. (Acceptance Rate=26.1%)
https://openreview.net/forum?id=vKpVJxplmB.

Sa M, Yoo ES, Koh W, Park MG, Jang HJ, Yang YR, Bhalla M, Lee JH, Lim J, Won W, **Kwon**

J, Kwon JH, Seong Y, Kim B, An H, Lee SE, Park KD, Suh PG, Sohn JW and Lee CJ† (2023). Hypothalamic GABRA5-positive neurons control obesity via astrocytic GABA. *Nature Metabolism*. https://doi.org/10.1038/s42255-023-00877-w.

Kwon J∗, Kim S∗, Kim DK, Joo J, Kim S, Cha M and Lee CJ† (2023). SUBTLE : An unsupervised platform with temporal link embedding that maps animal behavior. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) cv4animals workshop*. https://www.cv4animals.com/2023-accepted-papers

Nam MH∗, Ko HY∗, Kim D∗, Lee S, Park YM, Hyeon SJ, Won W, Chung JI, Kim SY, Jo HH, Oh KT, Han YE, Lee GH, Ju YH, Lee H, Kim H, Heo J, Bhalla M, Kim KJ, **Kwon J**, Stein TD, Kong M, Lee H, Lee SE, Oh SJ, Chun JH, Park MA, Park KD, Ryu H†, Yun M† and Lee CJ† (2023). Visualizing reactive astrocyte-neuron interaction in Alzheimer's disease using 11C-acetate and 18F-FDG. *Brain*. https://doi.org/10.1093/brain/awad037.

Kim DK∗, **Kwon J**∗, Cha M† and Lee CJ† (2022). Transformer needs NMDA receptor nonlinearity for long-term memory. *Advances in Neural Information Processing Systems (NeurIPS) MemARI workshop*. https://nips.cc/virtual/2022/workshop/49973

Kim D∗, Kim J, Jung W, Park J, Kim M, Shin A, Jeong YC, Park S, Shin G, Lee YW, **Kwon J** and Kim D† (2022). AVATAR : AI Vision Analysis for Three-dimensional Action in Real-time. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) cv4animals workshop*. https://www.cv4animals.com/2022-accepted-papers

Kim S∗, **Kwon J**, Park MG and Lee CJ† (2022). Dopamine-induced astrocytic Ca2+ signaling in mPFC is mediated by MAO-B in young mice, but by dopamine receptors in adult mice. *Molecular Brain*. https://doi.org/10.1186/s13041-022-00977-w.

Ju YH∗, Bhalla M, Hyeon SJ, Oh JE, Yoo S, Chae U, **Kwon J**, Koh W, Lim J, Park YM, Lee J, Cho IJ, Lee H, Ryu H† and Lee CJ† (2022). Astrocytic urea cycle detoxifies Aβ-derived ammonia while impairing memory in Alzheimer's disease. *Cell Metabolism*. https://doi.org/10.1016/j.cmet.2022.05.011.

Lee JM∗, Sa M∗, An H, Kim JM, **Kwon J**, Yoon BE and Lee CJ† (2022). Generation of Astrocyte-Specific MAOB Conditional Knockout Mouse with Minimal Tonic GABA Inhibition. *Experimental Neurobiology*. https://doi.org/10.5607/en22016.

✓ **Kwon J**∗, Jang MW and Lee CJ (2021). Retina-attached slice recording reveals light-triggered tonic GABA signaling in suprachiasmatic nucleus. *Molecular Brain*. doi:https://doi.org/10.1186/s13041-021-00881-9.

Jang MW∗, Kim TY, Sharma K, **Kwon J**, Yi E and Lee CJ† (2021). A Deafness Associated Protein TMEM43 Interacts with KCNK3 (TASK-1) Two-pore Domain K+ (K2P) Channel in the Cochlea. *Experimental Neurobiology*. https://doi.org/10.5607/en21028.

Won J∗, Kazan HH, **Kwon J**, Park M, Ergun MA, Ozcan S, Choi BY, Heo WD† and Lee CJ† (2021). Ultimate COVID-19 Detection Protocol Based on Saliva Sampling and qRT-PCR with Risk Probability Assessment. *Experimental Neurobiology*. https://doi.org/10.5607/en20063.

Han K∗, Lee M, Lim HK, Jang MW, **Kwon J**, Lee CJ, Kim SG and Suh M† (2020). Excitation-Inhibition Imbalance Leads to Alteration of Neuronal Coherence and Neurovascular Coupling under Acute Stress. *The Journal of Neuroscience*. https://doi.org/10.1523/jneurosci.1553-20.2020.

Oh SJ∗, Lee JM∗, Kim HB∗, Lee J, Han S, Bae JY, Hong GS, Koh W, **Kwon J**, Hwang ES, Woo DH, Youn I, Cho IJ, Bae YC, Lee S, Shim JW†, Park JH† and Lee CJ† (2019). Ultrasonic

Neuromodulation via Astrocytic TRPA1. *Current Biology*.
https://doi.org/10.1016/j.cub.2019.08.021.

Han YE*, **Kwon J**, Won J, An H, Jang MW, Woo J, Lee JS, Park MG, Yoon BE, Lee SE, Hwang EM, Jung JY, Park H, Oh SJ and Lee CJ† (2019). Tweety-homolog (Ttyh) Family Encodes the Pore-forming Subunits of the Swelling-dependent Volume-regulated Anion Channel (VRACswell) in the Brain. *Experimental Neurobiology*.
https://doi.org/10.5607/en.2019.28.2.183.

Woo J*, Min JO, Kang DS, Kim YS, Jung GH, Park HJ, Kim S, An H, **Kwon J**, Kim J, Shim I, Kim HG, Lee CJ† and Yoon BE† (2018). Control of motor coordination by astrocytic tonic GABA release through modulation of excitation/inhibition balance in cerebellum. *PNAS*.
https://doi.org/10.1073/pnas.1721187115.

Kwon J*, Park MG, Lee SE and Lee CJ† (2018). Development of a Low-cost, Comprehensive Recording System for Circadian Rhythm Behavior. *Experimental Neurobiology*.
https://doi.org/10.5607/en.2018.27.1.65.

Kwon J*, An H, Sa M, Won J, Shin JI and Lee CJ† (2017). Orai1 and Orai3 in Combination with Stim1 Mediate the Majority of Store-operated Calcium Entry in Astrocytes. *Experimental Neurobiology*.
https://doi.org/10.5607/en.2017.26.1.42.

Ha GE*, Lee J*, Kwak H, Song K, **Kwon J**, Jung SY, Hong J, Chang GE, Hwang EM, Shin HS, Lee CJ and Cheong E†. (2016). The Ca2+-activated chloride channel anoctamin-2 mediates spike-frequency adaptation and regulates sensory transmission in thalamocortical neurons. *Nature Communications*.
https://doi.org/10.1038/ncomms13791.

ACHIEVEMENTS   **Excellent Paper Award**, 2023, *Korean Artificial Intelligence Association (JKAIA)*
Brain-inspired Lp-Convolution benefits large kernels and aligns better with visual cortex

Patent Application & Technology Transfer, 2023-02-28, *Application Number : 10-2023-0027219*, Device and Method for Classification of Human and Animal Behavior, Patent Contribution=35%
◇ Finalized a technology transfer with ACTNOVA Inc.

Best Presentation Award, 2022, *Korean Society for Brain and Neural Sciences (KSBNS)*
ABCD-analysis : Mapping animal behavior and differential analysis of kinematic features without selection bias

Young Investigator Award, 2022, *Korean Society for Molecular and Cellular Biology (KSMCB)*
Retina-attached slice recording reveals light-triggered tonic gaba signaling in suprachiasmatic nucleus

Best Poster Award, 2021, *Center for Cognition and Sociality (CCS) Workshop*
Mapping Behavior with DECLARE : Deep Embedded Clustering of Action REpresentation

Full-Ride Scholarship for Doctoral studies, 2014-2022, *Korea University - Korea Institute of Science and Technology (KU-KIST) Graduate School of Converging Science and Technology*

Full-Ride Scholarship for Bachelor's Studies, 2007-2012, *Korea - Japan Governments Joint Scholarship Program for Science and Engineering Students*

TALKS   **Brain-inspired AI**, 2024 Nov, *CSE 8803 - BMI course of Georgia Institute of Technology (Georgia Tech)*, Invited Lecture (Online, invited by Lu Mi).

Brain-inspired AI, 2024 Oct, *Kyungpook National University (KNU)*, Invited Seminar (In person, invited by Saekwang Nam).

SUBTLE : An Unsupervised Platform with Temporal Link Embedding that Maps Animal Behavior, 2024 Sep, *Korea Institute of Ocean Science & Technology (KIOST)*, Invited Seminar (In person, invited by Soomee Kim).

SUBTLE : An Unsupervised Platform with Temporal Link Embedding that Maps Animal Behavior, 2024 Jul, *Korea Brain Research Institute (KBRI)* , Invited Seminar (In person, invited by Jeongyeon Kim).

Transformer as a hippocampal memory consolidation model based on NMDAR-inspired nonlinearity, 2023 Oct, *IBS-CCS Symposium*, Oral Presentation (In person).

Memory editing in the brain - Eternal Sunshine of the Spotless Mind, 2023 Jul, *IBS Science in the Cinema Roof*, Invited Public Lecture (In person).

From human mind to artificial intelligence - Is ChatGPT a bridge, 2023 Jun, *Reading Festival at Jeonil High School*, Invited Public Lecture (In person).

Resemblences between transformer's nonlinearity and NMDA receptor dynamics, 2022 Dec, *IBS Winter School : AI-boosted Basic Science*, Invited Talk (In person, invited by Meeyoung Cha).

Resolving clustering bias during animal behavior mapping and kinematic profiling, 2022 Jun, *IBS Data Science Group seminar*, Invited Talk (Online, invited by Meeyoung Cha).

Age-dependent motor coordination analysis by 3D pose-estimation using AVATAR, 2021, *IBS 2021 2nd workshop*, Oral Presentation (In person).

Backpropagation and the Brain, 2020 Nov, *KAIST-NeuroAI Journal Club*, Oral Presentation (Hybrid).

Deep learning with NMDA receptor inspired activation function, 2020, *IBS 2019 year-end workshop*, Oral Presentation (In person).