Chris S. Ki

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Ph.D. in Neural Computation & Machine Learning — 2020 - Present
M.S. in Machine Learning — 2023

University of California, Berkeley — Berkeley, CA
B.A., Computer Science — 2014 - 2018
B.A., Molecular Cell Biology: Neurobiology with Honors

AWARDS AND HONORS

NINDS T32 Big Data Systems Neuroscience Grant — 2022 - 2024
Center for Neural Basis of Cognition Retreat Outstanding Poster Award — 2022
Richard King Mellon Presidential Fellowship — 2020 - 2022
Department Honors in Molecular Cell Biology — 2018
Undergraduate Program in Neural Computation (uPNC) REU Fellowship — 2017

RESEARCH EXPERIENCE

Carnegie Mellon University — Pittsburgh, PA
Graduate Student; Advisors: Byron Yu & Matthew Smith — 2020 - Present

- Analyzing simultaneously acquired neural and pupil data with Matlab to understand how a novel prefrontal cortex (PFC) brain-computer interface (BCI) is used to reduce neural variability over time.
- Designing a BCI task and experiments to study the volitional control of motivation in the motor cortex and its subsequent effects on kinematics of a reaching movement.
- Implementing dimensionality reduction & signal processing methods using Jupyter to develop a BMI decoder.

Carnegie Mellon University — Pittsburgh, PA
uPNC Summer REU Fellow; Advisor: Aryn Gittis — Summer 2017

- Investigated differences in neuronal discharge variability between the gradual depletion PD (Parkinson's Disease) mice model and acute depletion PD mice model

TEACHING EXPERIENCE

Cold Spring Harbor Laboratory — Laurel Hollow, NY
Course Assistant; *Using Suite2p for functional segmentation of neural imaging data* — 2023

Carnegie Mellon University — Pittsburgh, PA
Teaching Assistant; *Machine Learning 10707 Advanced Deep Learning* — Spring 2023

Carnegie Mellon University — Pittsburgh, PA
Teaching Assistant; *Neuroscience Institute Bootcamp* — Summer 2021 & Summer 2022

RELATED PROFESSIONAL EXPERIENCE

Howard Hughes Medical Institute Janelia Research Campus Ashburn, VA
Software Engineer Consultant; Advisor: Marius Pachitariu & Carsen Stringer Summer 2020 - Present

- Developed regression tests and registration metrics for suite2p, an open-source Python package that processes 2-photon calcium imaging data.
- Fix GitHub issues raised by suite2p users to help maintain the suite2p codebase

University of California, San Francisco San Francisco, CA
Python Programmer; Advisor: David Kokel 2019-2020

- Incorporated new software features (e.g.: Apache Airflow) in Python to streamline the automatic processing of high-throughput zebrafish behavioral assays
- Developed an open-source Python module for management of zebrafish husbandry

OUTREACH & ACADEMIC SERVICE

Dynamical Systems Study Group, Center for Neural Basis for Cognition, Pittsburgh, PA 2023-Present
Founder and Organizer

eLife Reviewer 2023

UPitt Community Engagement Center: BioBots STEAM Summer Camp, Pittsburgh, PA 2021
Summer Camp Organizer/Teacher

Exploratorium**,** San Francisco, CA 2019- 2020
Tinkering Studio/Explorables Volunteer Facilitator

TALKS

* and † denote equal contribution

Ki, C.S.*, Williamson, R.C.*, Umakantha, A.*, Yu, B.M., and Smith, M.A. Suppressing neural variability in the prefrontal cortex with a brain-computer interface. *NINDS T32 Workshop 2023*, Pennsylvania, United States.

CONFERENCE ABSTRACTS

* and † denote equal contribution

Chandrasekaran, A.N.*, McDonnell, M.*, **Ki, C.S.*,** Smoulder, A., Yu, B.M, Batista, A., Smith, M.A., Chase, S. Reward and perceptual difficulty drive distinct changes behavior and motor cortical activity. *Computational and Systems Neuroscience (COSYNE) 2024*, Lisbon, Portugal.

Williamson, R.C.*, Umakantha, A.*, **Ki, C.S.***, Yu, B.M., and Smith, M.A. A brain-computer interface in prefrontal cortex that suppresses neural variability. *Gordon Research Conference: Neurobiology of Cognition 2022*, Maine, United States.

Williamson, R.C.*, Umakantha, A.*, **Ki, C.S.***, Yu, B.M., and Smith, M.A. A brain-computer interface in prefrontal cortex that suppresses neural variability. *Computational and Systems Neuroscience (COSYNE) 2022*, Lisbon, Portugal.

Ki, C.S., Petrova, R., and Panagiotakos, G. Effects of modulating Calcineurin/NFAT signaling on migration and differentiation in the developing cerebral cortex. *MCB Honors Research Poster Session* 2018, Berkeley, CA.

PUBLICATIONS

* and † denote equal contribution

Ki, C.S.*, Williamson, R.C.*, Umakantha, A.*, Yu, B.M., and Smith, M.A. Suppressing neural variability in the prefrontal cortex with a brain-computer interface. (In preparation).

Myers-Turnbull, D., Taylor, J.C., Helsell, C., McCarroll, M.N., **Ki, C.S.**, Tummino, T.A., Kinser, R., Alexander, R., Gendelev, L., Ravikumar, S., Cheng, D., Keiser, M.J., Kokel, D. Simultaneous analysis of CNS ligands in zebrafish with SauronX highlights avenues in neuroactive compound discovery. (In preparation).

Petrova, R., Arjun, A., Wu, B., Torres, T., Hamid, S., Delgado, R., Su, Z., **Ki, C.S.**, Keefe, M., Qiu, L., Pedrozo, V., Pippin, H., Kriegstein, A., Nowakowski, T., Ellegood, J., Perch, J., Lim, D., Graef, I., Darmanis, S., & Panagiotakos, G. DYRK1A Kinase Regulates Cortical Development via NFAT-mediated Cell-specific Modulation of Calcium Signaling. (In preparation).

Willard, A.M., Isett, B.R., Whalen, T.C., Mastro, K.J., **Ki, C.S.**, Mao, X., and Gittis, A.H. (2019). State Transitions in the SNr Predict the Onset of Motor Deficits in Models of Progressive Dopamine Depletion in Mice. eLife.