Keiland W. Cooper

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*Last updated November 1st, 2021*

**Education**

**University of California, Irvine**

Ph.D., Neurobiology and Behavior (In progress)

**Indiana University, Bloomington**

B.S., Cognitive Science (Honors; May the 4th, 2019)

Certificate in Neuroscience; Minor in Psychology

**Awards**

Graduate Research Fellowship (GRFP) | National Science Foundation | 2021

School of Biological Sciences Travel Award | UC Irvine BioSci | 2021

Norman Weinberger Award | UC Irvine CNLM | 2021

Best International AI Research Organization | Wealth & Finance | 2020

DTEI Pedagogical Fellowship | UC Irvine | 2020

Cognitive Science Outstanding Research | Indiana University | 2019

GRFP (Honorable Mention) | National Science Foundation | 2018

Outstanding Contribution in Cognitive Science | Indiana University | 2018

**Publications**

[Preprint] **Increasing incidence of parosmia and phantosmia in patients recovering from COVID-19 smell loss.** Ohla, K., Veldhuizen, M.G., Green, T., Hannum, M.E., Bakke, A.J., Moein, S., Tognetti, A., Postma, E.M., Pellegrino, R., ... Cooper, K. W., ... Hwang, L.D. and Albayay, J. (2021) medRxiv

[8] **Hippocampal ensembles represent sequential relationships among discrete nonspatial events** Shahbaba, B., Li, L., Agostinelli, F., Saraf, M., Elias, G. A., Cooper, K. W., Baldi, P., Fortin, N. J. (In press) Nature Communications

[7] **Avalanche: an End-to-End Library for Continual Learning** Vincenzo Lomonaco, Lorenzo Pellegrini, Andrea Cossu, Antonio Carta, Gabriele Graffieti, ... Keiland Cooper, ... Davide Bacciu, Davide Maltoni (2021) Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition

[6] **Recent smell loss is the best predictor of COVID-19 among individuals with recent respiratory symptoms.**Gerkin, R. C., Ohla, K., Veldhuizen, M. G., Joseph, P. V., Kelly, C. E., Bakke, A. J., ... Cooper, K.W. ... and Baguma, M. (2020) Chemical senses

[5] **Smell and taste changes are early indicators of the COVID-19 pandemic and political decision effectiveness.** Pierron, D., Pereda-Loth, V., Mantel, M., Moranges, M., Bignon, E., Alva, O., Cooper, K. W., ... Dinnella, C. (2020) Nature Communications

[4] **COVID-19 and the chemical senses: supporting players take center stage.** Cooper, K. W., Brann, D.H., Farruggia, M.C., Bhutani, S., Pellegrino, R., Tsukahara, T., Weinreb, C., Joseph, P.V., Larson, E.D., Parma, V. and Albers, M.W., (2020) Neuron

**Publications**

[3] **More than smell—COVID-19 is associated with severe impairment of smell, taste, and chemesthesis.** Parma, V., Ohla, K., Veldhuizen, M. G., Niv, M. Y., Kelly, C. E., Bakke, A. J., Cooper. K. W., ..., Hayes, J. E. (2020) Chemical Senses

[2] **Coronaviruses and the chemical senses: past, present, and future** Pellegrino, R., Cooper, K. W., Di Pizio, A., Joseph, P. V., Bhutani, S., and Parma, V. (2020) Chemical senses

[1] **Medial entorhinal cortex activates in a traveling wave in the rat** Hernandez-Perez, J. J., Cooper, K. W., Newman, E. L. (2020) eLife

[0] **Can the Machine Understand: An Evidence Based Approach to the Chinese Room**

Cooper, K. W. (2018) IU Journal of Undergraduate Research

[Thesis] **Cholinergic modulation may explain hippocampal encoding and retrieval mode switching** Cooper, K. W. (2019) Indiana University, Bloomington Undergraduate Thesis

**Selected**

**Abstracts**

**Hippocampal ensembles represent the sequential order of nonspatial events.** Cooper KW, Li L, Saraf MP, Elias GA, Baldi P, Shahbaba B, Fortin NJ. (2021) Program No P858.03. Chicago, IL: Society for Neuroscience

**Medial prefrontal cortex represents ordinal position within a sequence of events**. Elias GA, Tran AH, Saraf MP, Cooper KW, Shahbaba B, Fortin NJ. (2021) Program No P858.01. Chicago, IL: Society for Neuroscience

**The sequential organization of hippocampal ensemble activity provides a key temporal signal supporting the memory for the order of events.** Saraf MP, Haghverdian D, Cooper KW, Elias GA, Shahbaba B, Fortin NJ. (2021) Program No P858.02. Chicago, IL: Society for Neuroscience

**Deep neural network models learn distinguishable features from hippocampal local field potential and ensemble data** Pan, C. J., Cooper, K. W., Li, L., Agostinelli, F., Saraf, M., Elias, G. A., Baldi, P., Shahbaba, B., Fortin, N. J.. (2021) UROP Symposium

**Hippocampal theta oscillations support nonspatial sequence coding in hippocampal neurons** Cooper, K. W., Shahbaba, B., Li, L., Agostinelli, F., Saraf, M., Elias, G. A., Bornstein, A., Baldi, P., Fortin, N. J.. (2021) SFN Global Connectome

**The neuroscience and AI feedback loop: Catastrophic Forgetting and Sequences** Cooper, K. W.. (2020) UCI AGS Symposium

**Cholinergic abolition disrupts encoding and retrieval mode switching** Cooper, K. W.. (2020) 11th Annual Emerging Scientists Symposium

**Selected**

**Abstracts**

**On neuroscience and AI** Cooper, K. W.. (2019) IUJUR Research Slam

**Is theta a traveling wave in the medial entorhinal cortex?** Hernández J, Cooper, K. W., Newman E.L.. (2018) Program No. 330.10. Society for Neuroscience

**Consequences of Catastrophic Forgetting on Semantic Representations Learned by Deep Neural Embedding Models** Cooper, K. W, Dachapally P.R, Jones M.N. (2018) Midwest CogSci [Best poster award]

**Teaching**

**As Co-Instructor:** *Enrollment Year*

|  |  |  |  |
| --- | --- | --- | --- |
| Continual Learning | Neuromatch | 5000+ | 2021 |
| Autonomous Robotics | Indiana University | 18 | 2019 |
| Programming in Cognitive Sciences | Indiana University | 27 | 2018 |

**As Teaching Assistant:**

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| --- | --- | --- | --- |
| Mind, Memory, and the Brain | UC Irvine | 142 | 2021 |
| Neurobiology and Behavior Laboratory | UC Irvine | 196 | 2020 |
| Neurobiology and Behavior Laboratory | UC Irvine | 93 | 2020 |
| Brain and Behavior | UC Irvine | 366 | 2020 |
| Cognitive Psychology | Indiana University | 80 | 2018 |
| Introduction to Neuroscience | Indiana University | 106 | 2017 |

**Mentorship**

Tien Lam | *now preparing for medical school*

Brandon McIntosh | *now preparing for medical school*

Chelsea Pan | *now Zendesk*

Troy Good | *now Amazon*

**University**

**Service**

UC Advocacy Network | University of California, Irvine (2021 -)

End Racism Initiative Committee | University of California, Irvine (2020 -)

Education Policy Committee | Indiana University (2016 - 2017)

Faculty Council | Indiana University (2016 - 2017)

Office of First Year Experience | Indiana University (2015 - 2016)

**SciComm**

AskANeuroscientist | Founder; Live Q/A via in class video-chat (>400 students)

Hoosier STARS | Co-founder; K-12 neuro demos reaching >300 students

Quora Writer | Answers to neuroscience and AI questions (800k+ views)

CNLM Ambassadors | Co-chair; SoCal Learning and memory outreach

The Boys and Girls Club | Taught primary school aged students about the brain

IU Science Fest | Led a booth with hands on sheep brain interaction

Celebrate Science Indiana | Led an EEG and brain booth > 500 people

Observatory Guide | Volunteer astronomical guide at the Kirkwood Observatory

**Networks**

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| --- | --- |
| Cognitive Science Society | Society for Neuroscience |
| Continual AI (co-founder) | Indiana Academy of Science |
| Global Consortium for Chemosensory Research | Psi Chi |
| Sigma Xi |  |

**Referee**

**Service**

|  |  |
| --- | --- |
| Physiological Reviews | CLVision @ CVPR |

**Open**

**Datasets**

Hippocampal ensembles represent sequential relationships among an extended sequence of nonspatial events (2021) Dryad https://doi.org/10.7280/D14X30

GCCR COVID-19 Questionnaire (2020) OSF https://osf.io/a3vkw/

Extracellular recordings from across the dorsoventral axis of the medial entorhinal cortex of the rat. hc-27 (2020) CRCNS https://crcns.org/data-sets/hc/hc-27/about-hc-27

**Selected**

**Press**

Kyle Wiggers (April 9, 2021) AI Weekly: Continual learning offers a path toward more humanlike AI. VentureBeat

(April 8, 2021) ContinualAI Releases Avalanche: An End-to-End Library for Continual Learning. Synced Review

Brooke Jarvis (January 28, 2021) What Can Covid-19 Teach Us About the Mysteries of Smell?. The New York Times Magazine

Misha Gajewski (December 9, 2020) Is Losing Your Sense Of Smell And Taste The First Sign Of Covid-19? More Research Says Yes. Forbs

Bob Curley (July 7, 2020) Lifestyle Changes You Can Make to Help Lower the 19 Risk Factors for Alzheimer’s. Healthline

Salynn Boyles (July 6, 2020) Majority of Patients with Mild Covid-19 Experience Altered Smell/Taste. Physicians Weekly

Katie Boateng (June 15, 2020) Episode 64 - An Interview with Some of the Authors. The Smell Podcast

Kristine Fellizar (August 7, 2019) Why Is My Arm Asleep? 6 Reasons Your Limbs Go Numb When You're Sleeping. Bustle

Ann Lewandowski (September 28th, 2018) IU undergraduates practice science outreach at Indiana high schools. IDS