

# Keiland W. Cooper

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*last updated November 1, 2018*

## Education

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### Indiana University Bloomington

COGNITIVE SCIENCE B.S CONCENTRATION: COMPUTATION, NEUROSCIENCE CERT.

*exp. May 2019*

Thesis: Hippocampal modes: the role of acetylcholine and theta (In progress)

## Research Projects

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WITH DR. MIKE JONES: COMPUTATIONAL COGNITIVE SCIENCE, ARTIFICIAL INTELLIGENCE

*2018 - Present*

Overcoming Catastrophic forgetting in connectionist embedding models.

WITH DR. FREDRIC SCHMITT: PHILOSOPHY OF MIND

*2018*

Can the Machine Think? An evidence based approach .

WITH DR. AMIT HAGAR: HISTORY AND PHILOSOPHY OF SCIENCE; QUANTUM COMPUTING

*2017 - 2018*

The Natural Computation of the Brain

WITH DR. EHREN NEWMAN: NEURAL CORRELATES OF LEARNING AND MEMORY

*2015 - Present*

Hippocampal Mode Switching computational model

Traveling Theta Wave in the Entorhinal Cortex

CA1 Assembly Fluorescence Imaging

Optic Flow and Theta Modulation

WITH RESSL LAB: BIOCHEMICAL STRUCTURE OF PROTEINS IN SYNAPTIC CONNECTIVITY

*2015*

Investigating the Structure of Membrane Protein YejM

INDEPENDANT

*2016 - Present*

Predicting Hippocampal CA1 activity with machine learning

Evolving neural networks to play games

AS PART OF PROGRAM

fMRI Data analysis - with Dr. Tom James, Dr. Josh Brown

Autonomous Robotics - with Dr. Randall Beer

Human EEG - with Dr. Ben Ramsden

## Networks

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PROFESSIONAL SOCIETIES

Indiana Academy of Science

Psi Chi

OTHER

ContinualAI.org, co-founder

Carboncopies, volunteer researcher

Student Organization for Cognitive Science, President

ADAPT Consulting, VP of Project Management

CONFERENCE COMMITTEE

Midwest Undergraduate Cognitive Science Conference

Learning: Fast, Deep, and Shallow

## Pedagogy & Higher Education

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### UNDERGRADUATE CO-INSTRUCTOR

Programming in the Cognitive & Info Sciences (COGS-Q 260) Spring 2018  
Computation in Cognitive Science (COGS-Q 320) Spring 2018

### UNDERGRADUATE TEACHING ASSISTANT

Introduction to Neuroscience (PSY-P 346), Dr. Ehren Newman - Fall 2017  
Cognitive Psychology (PSY-P 335), Dr. Franco Pestilli - Fall 2018

### COMMITTEE SEATS

Education Policy Committee  
Bloomington Faculty Council

## Awards

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### SUBMITTED

NSF GRFP

### FUNDED

2018	Ewing Prize
2018	Cognitive Science Outstanding Contribution Award
2017, 2018	Cognitive Science Research Award

## Trainings, Workshops, etc.

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Complexity Science Certificate, Santa Fe Institute  
Science Communication Workshop  
High Performance Computing and Supercomputing Workshop  
Aseptic Surgery: Proper Practice Training  
Viral Handling, Animal Handling, Institutional Animal Care Training  
FERPA, Data Protection and Privacy, Title IX Trainings  
IUNI Network Science Workshop  
Neurosurgery Shadowing, Riley Hospital

## Outreach and Service (Selected)

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Hoosier STARS, (co-founder, director)  
Brain Club at the Boys and Girls Club  
IU Science Fest  
Kirkwood Observatory Guide  
Celebrate Science Indiana

## Publications

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### IN PREPERATION

Hernandez, J., Cooper, K.W., Newman, E.L. ( ) Waveform changes of theta oscillations account for wide proportion of phase shift attributed to traveling waves in medial entorhinal cortex in behaving rats.

## **PUBLISHED**

Cooper K.W. (2018) Can the Machine Understand: An Evidence Based Approach to the Chinese Room. IUJUR

## **SELECTED ABSTRACTS/PRESENTATIONS**

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

Cooper K.W., Hernandez J, Newman E.L. (2018) Is theta in the Medial Entorhinal Cortex a Traveling Wave? Society for Neuroscience, Greater Indiana Chapter.

Cooper K. W. (2018) 3D Brain Model Extraction and Virtual Applications. (Panelist) Media School Graduate Association Conference.

Cooper K. W. (2017) Bridging the Gap: Natural Computation and Neural Systems. Indiana University Undergraduate Research Conference.

Cooper K. W., Osborn Z. (2016) Downstream Hippocampal Activity Prediction with Neural Networks. Midwest Undergraduate Cognitive Science Conference.