

# Keiland W. Cooper

✉ keiland.cooper@gmail.com | 🌐 www.kwcooper.xyz | ☎ (+1) 317-709-0563

4494 E Co Rd. 350 N, Danville IN, 46122

last updated November 9, 2018

## Education

---

### 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

---

### 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 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 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

---

### 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

---

### 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

## Skills

---

**Laboratory** Stereotaxic Rodent Neurosurgery, Histological Procedures/Sacrificial Perfusions, Signal Analysis, fMRI Analysis with Brain Voyager, Electrophoresis, Centrifugation, Cell Culturing

**Computational** Python, MATLAB, HTML5/CSS, Java, R, UNIX/Bash

**IT** APACHE/Ubuntu Server Initialization, Computer Assembly, Parallel Programming, SQL

## Awards

---

### *Submitted*

NSF GRFP

### *Funded*

2018 Ewing Prize

2018 Cognitive Science Outstanding Contribution Award

2017, 2018 Cognitive Science Research Award

## Trainings, Workshops, etc.

---

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)

---

Hoosier STARS, (co-founder, director)

Brain Club at the Boys and Girls Club

IU Science Fest

Kirkwood Observatory Guide

Celebrate Science Indiana

## Publications

---

### *In preparation*

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 4(1) 22-24

### *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.

## Press

---

Ann Lewandowski (September 28th, 2018) IU undergraduates practice science outreach at Indiana high schools IDS ([Link](#))

Alexandra Moussa-Tooks (August 14, 2018) The art of dissemination part 3: Care to share? SciU ([Link](#))

Liz Rosdeitcher (2017) Community Partnerships. ([Link](#))