Timothy M. Shea

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Goals

To develop and apply integrative computational models of cognition. In particular, I am interested in models of learning across timescales, from one-shot instructed learning to expert learning across the lifespan.

Education

Ph.D. Cognitive and Information Sciences, University of California, Merced (Planned 2019)
Area: Computational Cognitive Neuroscience

B.S. Computer Science, California State University, Sacramento (2014)
Magna cum Laude
Culminating Project: Wings Artificial Intelligence Library

Papers, Talks, and Posters

"Oscillations emerge from conflict in simulated subthalamic nucleus" (In Prep). Timothy M. Shea, Anne S. Warlaumont, and David C. Noelle.

"Transient Localist Representations in Critical Branching Neural Networks" (2017). Jeffrey J. Rodney, Timothy M. Shea, and Christopher T. Kello. *Language, Cognition, and Neuroscience*, Special Issue.

"Modeling Infant Speech Development with Spiking Neural Networks" (August 2016). Timothy M. Shea and Anne S. Warlaumont. Poster presented at *15th Neural Computation and Psychology Workshop,* Philadelphia, PA.

"Deep Autoencoding of Naturalistic Infant and Parent Vocalizations" (August 2016). Timothy M. Shea, Anne S. Warlaumont, Christopher T. Kello, David C. Noelle, Gina M. Pretzer, and Eric A. Walle. Poster presented at *15th Neural Computation and Psychology Workshop,* Philadelphia, PA.

"Learning Affordances with Sensorimotor Integration" (July 15, 2016). Timothy M. Shea. Lightning Talk at Telluride Neuromorphic Cognition Engineering Workshop 2016.

"A neurorobotic model of learning to shake a rattle" (2015). Forrest Yeh, Anne S. Warlaumont, YangQuan Chen, Timothy M. Shea, and Brandon Stark. Poster presented at *2015 Joint IEEE International Conference on Development and Learning and Epigenetic Robotics (ICDL-EpiRob).*

"Neuronal Dynamics and Spatial Foraging" (2015). Timothy M. Shea, Anne S. Warlaumont, Christopher T. Kello, and David C. Noelle. Peer reviewed conference paper in *Proceedings of the 37th Annual Meeting of the Cognitive Science Society.*

"Learning in Critical Branching Neural Networks" (July 21, 2015). Timothy M. Shea and Christopher T. Kello. Poster at 2015 Meeting of the Society for Complex Systems in Cognitive Science.

"Quantifying the Effects of Remote Control on Navigation Performance" (March 21, 2014). Tim Shea. Poster at 2014 California Space Grants Consortium Bay Area Affiliate Meeting.

Other Presentations

"Tapping to the beat with a robotic arm" (July 14, 2016). Tim Shea. Demonstration at Telluride Neuromorphic Cognition Engineering Workshop.

"How Do We Follow Instructions?" (March 7, 2016). Tim Shea. Talk at Cognitive and Information Sciences Graduate Group Meeting, UC Merced.

"Neuronal Dynamics and Adaptive Foraging" (November 10, 2014) Tim Shea. Talk at Cognitive and Information Sciences Graduate Group Meeting, UC Merced.

"Wings: Artificial Intelligence Library" (May 13, 2014). Tim Shea, Ethan Weidman, Chris Lawson, Tate Chamberlain, and Ken Barnett. Group presentation at Computer Science Senior Project Presentation Session, CSU Sacramento.

"V1KU Stereoscopic Tracking" (July 28, 2013). Tim Shea. CerealHack III, HackerLab, Sacramento.

"FictionGun Demonstration" (November 11, 2012). Melody Stone, George Michel, Joshua Smith, and Tim Shea. CerealHack II, HackerLab, Sacramento. Intel Grand Prize winning presentation and People's Choice award.

Skills

C++, C#, Java, Python, D, GLSL/HLSL, HTML, CSS, Javascript, PHP, Matlab, SQL, R

IPC, Multithreading, OpenGL, CUDA (Python and limited C++), Cluster Computing (Sun Grid Engine, AWS)

Profiling (VS, Java Mission Control), Unit Testing (JUnit, GoogleTest, VS), Version Control (Hg, Git, Svn), Issue Tracking (Mantis), Visual Studio, Eclipse, PyCharm, Windows, Unix, Oracle, MySQL, Django

Arduino, Phidgets, Roomba SCI, V1KU neuromorphic camera, TrueNorth, SpiNNaker, TensorFlow, Keras

Automata, Expert Systems, Random Search, Planners, Genetic Algorithms, Reinforcement Learning, Predictive Learning, Unsupervised Learning, Naturalistic Data Processing, Deep Neural Networks, Spiking Neural Networks, Reservoir Computing, Neural Simulators (Brian, Nengo, Emergent), Cognitive and Linguistic Development

Simulation Methods, Acceleration Methods, Statistical Data Analysis, Statistical Inference, Experimental Design, Data Visualization, EEG Data Collection, Virtual Reality Development (Unreal)

Design Patterns, SDLC, Project Management, Requirements Analysis, Technical Communication, Design Models (Structural, UML), Formal Documentation (SRS, SDD, STS), Agile Development

Awards

California Space Grant Consortium Scholarship for Research (*March 2013*)
Chevron Computer Science Scholarship (*January 2013*)
Marie Perino Business Scholarship (*January 2012*)

Professional Experience

Teaching Fellow (Instructor) - University of California, Merced
Research Methods in Cognitive Science, Summer 2017

Graduate Student Researcher - University of California, Merced

NSF Grant: Infant Vocalization as Foraging for Caregiver Responses, Spring - Fall 2016, Summer 2017
Simbrain Software Developer, Winter 2016

Teaching Assistant - University of California, Merced
Introduction to Cognitive Science, Fall 2014
Cognitive Neuroscience, Spring 2015
Minds, Brain, and Computation, Fall 2015
Agent-Based Modeling, Spring 2017

Software Developer - State Water Resources Control Board (May 2011 - August 2014)

Societies and Service

Cognitive Science Coffee Co-Op, Organizer (2017)
Computational Neuroscience Journal Club, Organizer (Spring 2016)
Cognitive Science Society, Student Member
Association for Computing Machinery, Student Member (2012)
Invasive species removal for American River Parkway Foundation (April 2014 - Current)
“An Evening of Free Will” Faculty Panel Discussion, Organizer (April 13, 2014)
Cognitive and Information Science Graduate Group Meeting, Organizer (Spring 2014)