

Sarah Katherine Luca

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EDUCATION

The University of Arizona, Tucson, AZ

PhD Student in Applied Mathematics, 3.77/4.0 GPA

Expected 2024

Master of Science in Applied Mathematics 3.77/4.0 GPA

Awarded December 2020

University of North Carolina at Asheville, Asheville, NC

Bachelor of Arts in Pure Mathematics and General Psychology, 3.86/4.0 GPA

Awarded May 2016

Neuroscience Minor

Research Interests: Machine Learning/Artificial Intelligence, Spiking Neural Network Models, Neural Computation, Dynamical Systems

EXPERIENCE

The University of Arizona, Tucson, AZ

Project: *Characterizing Spindles using Feature Extraction and Fuzzy C-Means Clustering*

Spring 2020 – Fall 2020

Faculty Advisor: Dr. Jean-Marc Fellous

- Analyzed time-series data using principal component analysis and fuzzy c-means clustering
- Developed MATLAB code for the generation of artificial time-series data (spindles)

Project: *Achieving a Balanced State in Cortical Network Models*

Fall 2019

Faculty Advisor: Dr. Kevin Lin

- Researched methods of modeling self-organized balance of neural activity
- Explored integrate-and-fire and Hodgkin-Huxley neuron models
- Implemented simple integrate-and-fire model in MATLAB

Massachusetts Institute of Technology, Cambridge, MA

Project: *Invariant Representation of Images Under Change in Illumination*

Summer 2015

Faculty Advisor: Dr. Tomaso Poggio

- Developed theory for recognition of images under variable illumination
- Utilized group theory, linear algebra, and machine learning
- Tested theory by running experiments in MATLAB with large data sets of facial images

University of North Carolina Asheville, Asheville, NC

Project: *Dynamical Analysis of Postural Sway*

Spring 2014

Faculty Advisor: Dr. Patrick Foo

- Utilized nonlinear dynamical methods (Hurst rescaled range and approximate entropy) to analyze force plate data obtained from human subjects

PUBLICATION

Luca, S., Nauert, E., Chichester, K., Buckner, J., Foo, P., & Kaur, A. (2017) *Working Memory and Cognitive Flexibility Training May Indicate Evidence of Training Effect but Do Not Show Transfer to General Fluid Intelligence in College Students*. IMPULSE.

TECHNICAL SKILLS/KNOWLEDGE

- Machine Learning/Artificial Intelligence
- Data Science/Image and signal processing
- Languages (in order of proficiency): MATLAB, Python, Java, C++

ACHIEVEMENTS/AWARDS

- Successfully completed a thru-hike of the 2,190-mile Appalachian Trail (March 2017 – September 2017)
- Top Graduating Mathematics Student – University of North Carolina Asheville (2016)
- University Research Scholar – University of North Carolina Asheville (2016)
- SYNAPSE Conference Travel Award – Presbyterian College (2016)