Michael L. **Iuzzolino**

Graduate Research Assistant · Computer Science Graduate Student

Broomfield CO, 80021

520.405.3485 | michael.iuzzolino@colorado.edu | michael-iuzzolino.github.io | https://github.com/michael-iuzzolino

"I would rather have questions that can't be answered than answers that can't be questioned." – Richard P. Feynman

Interests & Skills

Deep Learning, Interactive Machine Learning, Explainable Artificial Intelligence, Reinforcement Learning, Information Visualization, Genetic Algorithms, Generative Adversarial Networks, Bayesian Deep Learning, Biologically-Inspired Multi-Agent Systems, Computer Vision, Natural Language Processing, Cognitive Modeling, Human-Robot Interaction, Data Analysis, Full-stack Web Development.

Languages

3 Yrs.	**Python**, Numpy, Scipy, OpenCV, Pandas, TensorFlow, Keras, scikit-learn, Flask
2 Yrs.	**Web Development**, HTML5, CSS3, PHP, D3.js
0.5 - 2 Yrs.	**Other Languages**, C, C++, C#, ROS, MATLAB, R, Linux, LaTeX
> 0.5 Yrs.	**Software**, Unity, Blender, Adobe Photoshop CS6, Adobe Illustrator CS6

Education

University of Colorado Boulder — *Boulder, Colorado*

Ph.D. in Computer Science — *Aug. 2016 - Exp. May. 2021*

- Currently working under Dr. Danielle Szafir as a Graduate Research Assistant, funded by Lockheed Martin and the U.S. Air Force.
- 1 Year of Graduate Teaching Assistantship.
- Received Dean's Fellowship.

University of Arizona — *Tucson, Arizona*

Bachelor's of Science — *Jan. 2011 - Dec. 2015*

- Completed Triple Major in Applied Mathematics, Molecular & Cellular Biology, and Neuroscience & Cognitive Science.
- Received the Centennial Achievement Award, which is award to only two students campus-wide annually.

Research Experience & Projects

Interactive Machine Learning for Collaborative Human-Machine Perception — *University of Colorado Boulder*

Graduate Research Assistant — *May. 2017 - PRESENT*

- Implementing cutting-edge deep learning algorithms for time-series analysis and classification.
- Development of novel visualization system for semi-supervised machine learning in satellite image detection, tracking, and classification for defense applications.
- Conducting research on optimal query policies for active learning, semi-supervised training paradigms.
- Positioning for integration in the Operational Battlespace Awareness Center (OBAC) via collaboration with Lockheed Martin and the US Air Force.

Human-Robot Interactions: On the Positive Treatment of Robots — *University of Colorado Boulder*

Lead Researcher & Software Engineer — *Jan. 2017 - PRESENT*

- Investigating the effects of robot morphology and collaboration on a user's willingness to assist a robot at cost to real monetary gain.
- Developed virtual music environment utilizing infrared body tracking via VICON System.
- Designed experimental setup and engineering all software used to conduct study.

Virtual to Real-World Transfer Learning for Robot Navigation — *University of Colorado Boulder*

Lead Researcher & Deep Learning Developer — *Oct. 2017 - PRESENT*

- Implemented suite of deep learning models to learn on simulated trail environments in Unity.
- Assisted in development of Unity environment for the collection of simulation data and testing of trained virtual agent.
- Developing ROS-Tensorflow interface for real-world robotic experimentation.
- Exploring Generative Adversarial Models and Variational Autoencoders for procedural generation of virtual training landscapes.

FlapPyBI:O - A Gaming Application of Neuroevolution of Augmenting Topologies

University of Colorado Boulder

Project Lead & Lead Programmer — *Aug. 2016 - Dec. 2016*

- Developed project ideas and managed small team of graduate students.
- Fully implemented Neuroevolution of Augmenting Topologies (NEAT) from scratch only using Python and Numpy. Refactored FlappyBird code base and successfully integrated NEAT. The system successfully learned, unsupervised, how to play FlappyBird and achieved astonishingly high scores of tens-of-thousands of points.

Habitable Observatory for Science, Tourism, and Expeditionary Living (HOSTEL)

University of Colorado Boulder

Space Habitat Design Project Lead & Crew Accommodations Lead & Systems Engineering Co-Lead — *Aug. 2016 - Dec. 2016*

- Managed team of 5 graduate students and 2 Lockheed Martin employees in semester-long aerospace engineering project focused on designing a space habitat to accommodate space tourism within the next 10 years.
- Organized weekly meetings, provided tasks and goals for team members of all habitat subsystems, served as primary writer on the project reports, and developed detailed cost estimations spanning development through spaceflight operations.
- Utilized Blender to develop 3D design mock-ups and operation animations; e.g., capsule / habitat docking procedures.

High-Powered Rocket Tracking via Embedded Systems

University of Arizona

Electronics Technician and Programmer — *May. 2015 - Dec. 2015*

- Developed software in C/C++ and Python to support electronics subsystems for real-time data logging, tracking, and modeling of high-powered model rockets.
- Cultivated electronics experience with IMUs, circuit design and fabrication, GPS tracking, and XBee serial communication protocols.
- Co-developed software with MATLAB Simulink to provide physical models of vibrational mechanical systems for educational use in controls engineering courses.

Evolutionary Developmental Biology Modeling

University of Arizona

Undergraduate Summer Programmer — *May. 2015 - Aug. 2015*

- Investigated regulation patterns of transcriptional networks undergirding the evolution of complex biological systems via *in silico* evolution simulations using Python and C++ during Summer Research Opportunity.

Parasitological Neuroimmunobiology Research

University of Arizona

Undergraduate Laboratory Assistant — *Jan. 2014 - Jan. 2015*

- Investigated *Toxoplasma gondii*'s predilection for specific neuronal subtype infection within a genetically engineered GFP *Mus musculus* system.
- Learned various microscopy methods, immunological staining techniques, fragile tissue handling and sectioning, as well as neuroscience principles and experimental design.

Adaptive Evolution Modeling

University of Arizona

Undergraduate Summer Mentee — *May. 2013 - Aug. 2013*

- Assisted graduate student in developing the antecedents of a mathematical model predicated on the R.A. Fischer Geometric Model to investigate adaptive evolution in N-dimensional chemotype space.
- Learned the basics of programming in Python.

Genetic Instability in Yeast

University of Arizona

Undergraduate Laboratory Assistant — *Jan. 2013 - Dec. 2013*

- Investigated molecular mechanisms of nuclear pore complex mediated gene gating and its effects on genetic instability in *Saccharomyces cerevisiae*.
- Learned PCR, gel electrophoresis, transfection, cell culturing, and other basic bench-work techniques.

NASA Challenges & Projects

Spacesuit User Interface Technologies for Students

University of Colorado Boulder

Lead Programmer — *Jan. 2018 - PRESENT*

- Developing artificial intelligence system for Augmented Reality to support extravehicular activity (EVA) procedures.

Reduced Gravity Student Flight Opportunities

University of Arizona

Undergraduate Researcher — *Sept. 2010 - Jul. 2011*

- Developed nationally competitive biochemistry experiment to determine effects of catalysts on abiogenesis in microgravity conditions.
- Conducted experiment aboard NASA's reduced gravity aircraft, resulting in successful production of pyrimidines, purines, and fully formed amino acids.

National Community College Aerospace Scholars

University of Arizona

Student Engineer — *Oct. 2010 - Mar. 2011*

- Wrote nationally winning Mars Sample Return Mission entailing innovative interplanetary space vehicle and rover designs.
- Placed 2nd in Mars Rover build competition at Jet Propulsion Laboratory.

Arizona Space Grant Consortium Intern

University of Arizona

Electronics Team Member

Aug. 2016 - Dec. 2016

- Designed and fabricated electronic subsystems supporting science objectives aboard weather balloon payloads; objectives included GPS tracking, solar flux measurements, support member stress-strain profiles, and temperature/pressure sensors.
- Internship concluded with presentations at the Annual Statewide Space Grant Symposium and Arizona Near Space Research (ANSR) conferences.

Teaching Experience

Art of Problem Solving

Online

Mathematics and Programming Grader

May. 2015 - PRESENT

- Nurturing foundations in mathematical pedagogy via daily grading of mathematics and programming homework ranging from pre-algebra to calculus, in addition to Python programming.

CSCI 1300 - Introduction to Computer Science

University of Colorado Boulder

Graduate Teaching Assistant & Software Engineer

Aug. 2016 - May. 2017

- Developed autograding software system, developed curriculum, and taught weekly hour-long recitations.

Aerospace Engineering - Mechatronics

University of Arizona

Undergraduate Teaching Assistant

Oct. 2015 - Dec. 2015

- Provided lectures on digital logic, circuitry, electronics, and general programming foundations.
- Supervised the laboratory, overseeing and guiding students on how to work with electronic components, draft and implement circuits, and integrate electronic circuits into mechanical devices.

Aerospace Engineering - Vibrations and Controls Laboratory

University of Arizona

Co-Instructor & Curriculum Developer

Oct. 2015 - Dec. 2015

- Taught engineering students how to model and analyze vibrational systems.
- Assisted students in professional technical report writing.
- Wrote and administered weekly quizzes, along with grading homework and laboratory reports.
- Constructed a comprehensive, cohesive laboratory manual from disarrayed experiments and lectures.

Honors & Awards

Awards

2016-2017 **Dean's Fellowship**, University of Colorado Boulder

2015 **Centennial Achievement Award**, University of Arizona

2012-2013 **Academic Distinction Award**, University of Arizona

2011-2012 **Japan Student Services Organization (JASSO) Scholarship**, Tohoku University, Japan

2011-2012 **Benjamin A. Gilman International Scholarship**, University of Arizona

2010-2011 **Wolslager Foundation Scholarship**, Pima Community College

Honors

2014 - 2015 **Nu Rho Psi**, National Honors Society in Neuroscience

2010 - 2012 **Phi Theta Kappa**, National Honors Society