Charles Edelson

Cedelson@iu.edu · github.com/edelsonc

EDUCATION

May 2024 (anticipated)
Doctor of Philosophy, Physics
Indiana University Bloomington - Bloomington

Oct 2019
Masters of Science, Physics
Indiana University Bloomington - Bloomington

May 2018
Masters of Science, Data Science
New College of Florida - Sarasota

May 2016
Bachelor of Arts, Physics and Marine Biology
New College of Florida - Sarasota

RESEARCH EXPERIENCE

Aug 2018 - Present
Graduate Research Assistant
Researching how dynamic natural scenery affects optimal estimators of wide-field motion in the Blowfly's (*Calliphora vicina*) visual system. Additionally, the project investigates the relationship between velocity estimation and predictive information encoding in visual systems. Key responsibilities include the design and construction of a specialized FlEye camera for signal recording, development of reading and validation software for the FlEye camera, statistical modeling of signals and computation of optimal estimators of motion, design of software for stimulus generation, and research into information bottleneck inspired neural network architecture.

Aug 2015 - May 2016
Thesis: Magnetosensory Abilities of the Whitespotted Bamboo Shark (*Chiloscyllium plagiosum*)
Project included animal husbandry, construction and computational modeling of a multidirectional Helmholtz coil array, experimental design of magnetic field orientation trails, technical writing in the form of a thesis, and an oral baccalaureate examination before a committee of four professors.

Aug 2015 - Mar 2016
Mote REU-USFSM Program
Collaborated with Mote scientists to research the electrosensitivity of adult Sandbar Sharks (*Carcharhinus plumbeus*) in response to prey-simulating electric fields. Conducted regular experimental trails, performed data analysis, and consulted on statistical analysis.

June 2014 - July 2014
I.T.E.C. Coral Reef Ecology Field Research Assistant
A field-research assistantship for the Coral Reef Ecology Course at the Institute for Tropical Ecology and Conservation. Organized and executed marine field research and oversaw student project design and implementation with an emphasis on the safe use of scuba.

TEACHING EXPERIENCE

Aug 2022 - Dec 2022 **P222 Lab Assistant Instructor**, Indiana University Bloomington
Developed and delivered lectures on physical concepts and lab content for introductory electricity and magnetism lab. Supervised student experiments and evaluated student performance both in the laboratory and in weekly lab reports.

June 2020 **Computational Neuroscience Teaching Assistant**, Neuromatch Academy
Facilitated flipped classroom style daily computational neuroscience workshops. Guided students in the design and implementation of independent research projects.

Aug 2019 - Dec 2019 **P221 Lab Assistant Instructor**, Indiana University Bloomington
Developed and delivered lectures on physical concepts and lab content for introductory mechanics lab. Supervised student experiments and evaluated student performance both in the laboratory and in weekly lab reports.

Feb 2018 - May 2018 **Statistical Inference II Teaching Assistant**, New College of Florida
Evaluated weekly assignments and provided feedback on student solutions using GitHub Classroom. Held virtual office hours and provided exam review sessions.

Feb 2015 - Dec 2017 **Physics I & II Teaching Assistant**, New College of Florida
Collaborated with the course professor to write weekly lectures and workshops designed to supplement the course curriculum. Delivered the lectures and supervised student problem solving pods during workshops.

PROFESSIONAL EXPERIENCE

July 2021 **NMA Deep Learning Course Content Reviewer and Editor**
Reviewed and edited tutorials for the 2021 Neuromatch Academy Deep Learning summer course. Ensured course content was approachable to students and worked to clarify or add content where material was unclear.

Feb 2018 - May 2018 **Practicum: Divers Alert Network Data Science Internship**
Worked with the research division of DAN to apply modern data science techniques to dive accident data. Organized and analyzed survey data, created data dashboards, performed simulated dive experiments, consulted on statistical analyses, wrote internal technical documents, and co-authored manuscripts.

June 2017 - Aug 2017 **Allen Institute for Brain Science Human Cell Types Internship**
Developed the altasplot R package to simplify creating reproducible brain atlas visualizations. The package brings brain atlas data and visualizations to a wider audience in both the scientific community and general public.

UNIVERSITY SERVICE AND CAMPUS INVOLVEMENT

May 2019 - May 2021 **Physics Graduate Student Council Vice President**
This position is responsible for organizing elections and participating in regular cabinet meetings. Additionally, the Vice President oversees the budget and helps organize and execute graduate student gatherings and events. Works as a liaison between graduate students and the administration of the physics department.

Aug 2020 - Dec 2020 **Physics Graduate Student Mentor**
Mentored first year physics graduates students and helped them acclimate to the physics PhD program. Provided insight and advice for living in Bloomington and making the most out of their campus resources during the Covid-19 pandemic.

Oct 2019 & Oct 2020 **Indiana University Bloomington ScienceFest Volunteer**
Assisted in organization and set-up of the event facilities. Performed scientific demonstration for the general public and provided resources for further education.

PUBLICATIONS

Journal Articles

- P. Buzzacott, **C.J. Edelson**, J. Chimiak, F. Tillmans, "Health and wellbeing of recently active U.S. scuba divers", *Diving and Hyperbaric Medicine*, Volume 52, No. 1, March 2022, pp. 16-21
- P. Buzzacott, **C.J. Edelson**, C.M. Bennett, P.J. DeNoble, "Risk factors for cardiovascular disease among active adult US scuba divers", *European Journal of Preventive Cardiology*, Volume 25, Issue 13, September 2018, pp. 1406-1408
- (Submitted) L. Crawford, **C.J. Edelson**, R.E. Hueter, J. Gardiner, "Behavioral electrosensitivity increases with size in the sandbar shark, *Carcharhinus plumbeus*"

Technical Reports

- (Contributor) P.J. DeNoble, Eds., "DAN Annual Diving Report 2019 Edition", Durham: Divers Alert Network, 2019

CONFERENCE PRESENTATIONS

Presentations

- P. Buzzacott, A. Leishman, **C.J. Edelson**, J.E. Blatteau, "Vietnamese fishermen dive profiles, simulated modifications and new diver profile analysis freeware" South Pacific Underwater Medicine Society Annual Scientific Meetings, HMAS Penguin, Sydney, May 2021
- P. DeNoble, V. Papadopoulou, P. Buzzacot, **C.J. Edelson**, M. Pieri, D. Cialoni, K. Lambrects, C. Belastra, A. Marroni, "Inter-Individual variability of post-dive venous gas bubbles occurrence: an invitation for multigentric collaborative study", Second Tricontinental Conference on Diving and Hyperbaric Medicine, Durban, South Africa, Sep 2018

Posters

- P. Buzzacott, **C.J. Edelson**, J. Chimiak, "Health status of active U.S. scuba divers 2011-2017", The Undersea and Hyperbaric Medicine Society 53rd Annual Scientific Meeting Jun 2020
- P.J. DeNoble, V. Papadopoulou, P. Buzzacot, **C.J. Edelson**, M. Pieri, D. Cialoni, K. Lambrects, C. Balestra, A. Marroni, "Consistency of venous gas emboli status after three controlled pool diving exposures: a pilot study", The Undersea and Hyperbaric Medicine Society 51st Annual Scientific Meeting, Orlando, Florida, Jun 2018
- L. Crawford, **C.J. Edelson**, J. Gardiner, "Behavioral Sensitivity of Adult Sandbar Sharks to Prey-Simulating Electric Fields", 145th Annual American Fisheries Society Conference, Portland, Oregon, Aug 2015

SEMINAR PRESENTATIONS

- "Statistical Hypothesis Testing for Physicists", Homer A. Neal Student Seminar Series, Indiana University, April 2022

- "Modern Data Science: An Overview", Homer A. Neal Student Seminar Series, Indiana University, Sep 2022
- "Entropy - History and Application to Data Science", Statistics Seminar, New College of Florida, Dec 2017
- "Multidimensional Scaling", Statistics Seminar, New College of Florida, Oct 2017
- "Going with the Flow - Derivation and Application of the Equations of Motion for Fluids", Physics Seminar, New College of Florida, Sep 2015

TECHNICAL SKILLS

Programming Languages: Python · R · MATLAB · Mathematica · Go (familiar) · Rust (familiar)
Popular Libraries/Framework: Scipy · Numpy · SciKit Learn · Pandas · PyTorch · Tidyverse
Development Tools: Git · Tmux · Jupyter · LaTeX · Markdown · Google Colab · SQL · Pipenv