RITIKA SIBAL

Tel No: (734) 780-9410 **Email**: rsibal@bu.edu
Website: ritika-sibal.squarespace.com

EDUCATION

Boston University, Boston, Massachusetts **August 2023 – Present**
Master of Science in Biology, Ecology Evolution & Behavior ***4.0/4.0***
Awards: Master's Merit Scholarship, Denton Award for Best Thesis

University of Michigan, Ann Arbor, Michigan **April 2020**
Bachelor of Science in Engineering, Computer Engineering ***3.5/4.0***
Awards: Dean's List (2016-2020)

WORK EXPERIENCE

Primate Ecology and Conservation Lab Boston, MA
Graduate Research Assistant, Dr. Cheryl Knott **Aug 2023 – Present**

- Studied Bornean orangutan positional behavior maturation using traditional focal follow sampling. Found a significant negative effect of age on positional behavior diversity **(manuscript in preparation).**
- Developed a novel methodology for longitudinal and non-invasive animal locomotion analysis using thermal imaging and visual computer vision *(collaboration with Boston University Computer Science department)* **(manuscript in preparation).**
- Investigating the presentation of downclimbing, terrestrial gait, and bipedal behavior in Bornean orangutans using computer vision and kinematic analyses.

Barton Research Group Ann Arbor, MI
Research Assistant, Dr. Alex Shorter, and Dr. Kira Barton **Sept 2016 – June 2020**

- Developed a hybrid artificial neural network using the LSTM and HMM models to enable behavior classification of dolphins based on motion data with 97% accuracy **(manuscript published).**
- Trained a computer vision model to coarsely classify dolphin swimming behavior as a comparison to the previously developed LSTM-HMM network.

Atmosic Technologies Boston, MA
Embedded Software Engineer **May 2022 – July 2023**

- Developed driver for radio (802.14.5) communication on a custom chip, enabling low-power IoT applications.
- Coded internal debugging tools to aid in application development and delivery.

Apple Cupertino, CA
Firmware Automation Engineer **Aug 2020 – May 2022**

- Head engineer on 2021 MacBook release: discussed feature development and drove organization-wide meetings.
- Created embedded automation frameworks through a combination of Python, Embedded C, and CAD Design

Autonomous Battery Charging for Wildlife Drones Ann Arbor, MI
Co-founder **Aug 2019 – April 2020**

- Designed and built a drone capable of autonomous wildlife surveys to and from a base charging station.
- Devised and implemented GPS waypoint following, obstacle avoidance algorithm, and a close proximity localization scheme to land the drone on a contact charging station precisely.

Deep Robot Optical Perception Lab Ann Arbor, MI
Research Assistant, Dr. Matthew Johnson-Roberson **May 2018 – June 2020**

- Utilized inverse and forward kinematics to control the open-source 'Fetch' robot using ROS packages for object perception and manipulation.
- Designed and constructed a 3D-printed autonomous surface vehicle (ASV) for low-cost lake surveillance.

VOLUNTEERING PROJECTS

Adaptable Wheelchair for Animals **Apr 2022 – Oct 2022**

- Modeled (Computer Aided Design) and built a custom 3D-printed wheelchair for a goat lacking front-leg mobility.

Alma Bonita Animal Rescue **Sept 2021 – Jan 2023**

- Cared for rescue animals semiweekly by mucking pens, feeding, and brushing.
- Assisted with longer-term grooming and maintenance including grinding animal nails and cleaning enclosures.

TEACHING EXPERIENCE

Animal Behavior *(Graduate)* **Aug 2024 – Dec 2024**

- Taught 3-hour lab sections twice a week. Developed background presentations, which included lab instructions and interactive activities.
- Monitored scientific experiments studying basic animal behavior principles. Answered student questions and held external office hours.
- Graded ~40 scientific lab reports weekly, providing detailed feedback.

Introduction to Embedded Systems *(Undergraduate)* **Sept 2019 – August 2020**

- Lead 2 weekly, 3-hour lab sections consisting of instructional presentations followed by lab discussions.
- Assisted in course restructuring. Built new embedded kits for all labs by first soldering kits and then quality testing.

PUBLICATIONS

Sibal, Ritika, Kane, Erin, Knott, Cheryl. "The Ontogeny of Positional Behavior in Wild Bornean Orangutans (*Pongo pygmaeus wurmbii*". Manuscript in preparation. Aug 2025

Sibal, Ritika, Liew, Evelyn, Betke, Margrit Knott, Cheryl. "DeepHutan: A novel, robust computer vision model for wild Borean orangutan (*Pongo pygmaeus wurmbii*) pose estimation.". Manuscript in preparation. July 2025

Sibal, Ritika, Zhang, Ding, Shorter, Alex, Barton, Kira. "Bidirectional LSTM Recurrent Neural Network Plus Hidden Markov Model For Wearable Sensor Based Dynamic State Estimation", Dynamic Systems and Control Journal. May 2019

Sammons, Patrick, Bollieni, Sahit, **Sibal, Ritika,** and Barton, Kira. "Temperature and Humidity Variation Effect on Process Behavior in Electrohydrodynamic Jet Printing of a Class of Optical Adhesives", *Solid Free Form Journal.* August 2017

SOFTWARE SKILLS

Platforms: Windows, Mac OS, Linux
Languages: Python**,** C++, R, MATLAB, Arduino
Applications: CAD (Autodesk Fusion 360 and 3Ds Max), Microsoft Office, and Adobe Photoshop
Others: Electronics and Microcontrollers, 3D Printing/Designing

LANGUAGES

English (Fluent), Bahasa Indonesia (Fluent), Hindi (Proficient), Mandarin (Basic)