Johannes Nelson

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EDUCATION

University of Pennsylvania - Philadelphia, PA   August 2021 - August 2023
- Master of Environmental Studies
  - Individualized concentration in Machine Learning and Bioacoustics for Conservation
  - Relevant Coursework: *Applied Machine Learning | Deep Learning for Data Science | Statistical Computing in R | Bioacoustic Monitoring: Principles and Practice |Ornithological Principles | Occupancy Modeling*

Colorado College –B.A. English Literature   September 2009 – May 2011
- B.A. English Literature

National Outdoor Leadership School (NOLS) – Southwest USA   January 2009 – May 2009

TECHNICAL SKILLS

Programming and Data Analysis: R, Python, PyTorch, ArcGIS Pro, Bioacoustics, Machine Learning, Deep Learning

Ecological Fieldwork: Bird banding (songbirds and northern saw-whet owls), mist-net operations, point counts, nest searching, field botany, passive acoustic monitoring, occupancy modeling, distance sampling

RESEARCH/PROJECTS

Passive Acoustic Monitoring Study of Rail Community   May 2022
- Planned and executed passive acoustic monitoring survey for the purposes of improving Virginia rail distribution data–recording over 1,000 hours at 28 sites
- Developed and implemented R scripts to enable streamlined validation and analysis of detections from deep learning audio classification models
- Used occupancy modeling framework to analyze detection data and to assess impact of covariates

Developing Convolutional Neural Network for Acoustic Monitoring of Rare or Cryptic Species   March 2023
- Curated and preprocessed audio training datasets using R and Python, sourcing from public databases
- Leveraged the PyTorch library to experiment with sophisticated deep learning architectures and innovative data augmentation techniques–ultimately creating and deploying an ensemble of ResNets
- Wrote detailed technical report on model development and training
- Leveraged GitHub for version control and codesharing (Repository: RailNET)

Gather Baseline Data for Restoration Project using Passive Acoustic Monitoring   April 2023
- Collaborated with National Wildlife Refuge to conduct passive acoustic monitoring survey of degraded urban marsh to establish avian community baseline data ahead of restoration project
- Used combination of custom-trained and pre-existing deep learning models to monitor cryptic marsh bird community
- Used relational database (SQLite) to manage project data such as detections, deployments, locations, and equipment.

PROFESSIONAL EXPERIENCE

Conservation International – Arlington, VA   October 2023 - January 2024
Data Analysis Consultant
- Short-term consultancy to streamline and automate data wrangling/analysis of tree monitoring data for the Priceless Planet Coalition, a partnership with MasterCard which includes a large portfolio of global restoration projects in more than twenty countries around the world.
- Created an extensive codebase of R scripts enabling non-technical users to run incoming data through multiple modular components of a multi-faceted data pipeline.
- Developed automated and semi-automated processes within the pipeline to flag invasive species and to classify planted species as native/alien based on geolocation data, occurrence information, and relevant text extracted and parsed from plant databases
- Leveraged the LangChain library in Python to integrate Large Language Models into classification process, engineering prompts and developing a workflow to automatically parse relevant textual data in order to make classification decisions with cited evidence..

Willistown Conservation Trust – Newtown Square, PA   June 2022 - August 2022
Field Technician - Eastern Towhee Project
- Assisted lead researcher in nest searching, active mist-netting, trapping, banding, and MOTUS tagging of Eastern Towhees

Carol Morgan School– Santo Domingo, Dominican Republic   August 2019 - June 2021
5th Grade Social Studies Teacher
- Designed units of study focused on the social and environmental impacts of a linear, materials economy; bias and power in historical narratives; and how resource management choices impact social and environmental welfare

International School of Dakar – Dakar, Senegal   August 2017 – June 2019
5th Grade IB Primary Years Program (PYP) Teacher
- Taught students from 15+ nationalities and fostered a culture of empathy, collaboration, and open-mindedness
- Aided in the school's transition into the IB Primary Years Program—an interdisciplinary, inquiry-based approach
- Planned field experiences for students to make connections to local communities and ecosystems while learning about key resource management issues in the region such as overfishing, desertification, and food scarcity

International College – Beirut, Lebanon   August 2014 – June 2017
English Department Head & 5th Grade Teacher
- Worked in a leadership role with 30+ teachers of varying cultural, religious, linguistic, and ethnic backgrounds
- Planned and implemented curriculum on topics such as urban planning, living systems, and human rights

International School of Monagas – Maturin, Venezuela   August 2011 – June 2012
Middle/High School English, Drama, History Teacher
- Taught students from a wide variety of socio-economic backgrounds with limited resources
- Planned and led multiple overnight field trips into the Orinoco River Delta where students learned from indigenous teachers about local culture, flora and fauna

COMMUNITY INVOLVEMENT

Great Marsh Institute - *Member of Scientific Advisory Board*
- Regularly meet to report on and advise scientific research at the Great Marsh, to plan and participate in public outreach events

Rushton Woods Banding Station - *Bird Banding Technician*
- Assist banders in charge with mist-net operations, processing, banding, and data collection for both migratory songbirds and northern saw-whet owls.

ADDITIONAL INFORMATION

Languages: English (native), German (advanced), Spanish (advanced), Italian (intermediate), Arabic (beginner/intermediate)
Interests: Birding, writing, programming, surfing, travel, photography, tabletop and video games, rock climbing, hiking