# Talha Siddique

Durham, NH

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## SUMMARY

Ph.D. in Computer Engineering with a foundation in Computer Science and Computational Economics. Specializing in embedded machine learning (ML), remote sensing, and optimizing ML for resource-limited systems. Proficient in Bayesian methods, reinforcement learning, deep learning, Python, and C/C++, with a proven ability to quickly adapt to new programming environments, and publish in peer-reviewed journals and conferences.

## EDUCATION

**University of New Hampshire, Durham, NH** **Aug 2019 – Jan 2025**
Ph.D. in Electrical and Computer Engineering

**University of New Hampshire, Durham, NH** **Aug 2017 – Jul 2019**
Master of Science in Natural Resources: Environmental Economics

**BRAC University, Dhaka, Bangladesh** **Sep 2012 – Dec 2016**
Bachelor of Science in Computer Science

## EXPERIENCE

**Center for Coastal and Ocean Mapping/NOAA-UNH Joint Hydrographic Center, Durham, NH** **Feb 2025 – Present**
**Postdoctoral Research Associate**

- Conduct independent research focused on integrating robust machine learning models with seafloor acoustic data to investigate environmental variability, including real-time processing.
- Leverage expertise in signal processing and remote sensing to develop innovative tools for analyzing seafloor scatter and sediment properties.
- Develop and fine-tune large language models (LLMs) for semantic understanding and decision-making in maritime navigation systems.
- Contribute to projects funded by National Oceanic and Atmospheric Administration (NOAA)

**University of New Hampshire, Durham, NH** **Aug 2017 – Jan 2025**
**Remote Sensing Lab**
**Ph.D. Research Assistant**

- Developed a ML-enabled magnetometer system aimed at predicting geomagnetic anomalies.
- The implemented system reduced the setup and operating cost to under $100, compared to the standard $3000 fluxgate magnetometers, and eliminated the requirement for one year's worth of data by enabling real-time baseline correction.
- Developed and deployed embedded ML models using TensorFlow-Lite on ARM-based microcontrollers, optimizing custom loss functions and algorithms for efficient on-device inference in resource-constrained systems.
- Implemented various offline Bayesian deep learning architectures to accurately assess model and data uncertainties, employing advanced TensorFlow and PyTorch techniques.
- Authored and led multiple peer-reviewed journal and conference papers, including publications in IEEE.
- Contributed to a National Science Foundation (NSF)-funded project, working on the forefront of ML research and application in space weather prediction.

**Bioeconomics Lab and Artificial Intelligence Group**
**M.S. Research Assistant**

- Developed environmental strategies using risk-sensitive reinforcement learning in R, predicting optimal pest control policies.
- Utilized Bayesian statistics to quantify data and parameter uncertainties in predictive modeling environments.
- Implemented an agent-based model platform, to simulate the agricultural environment in focus.
- Contributed to a United States Department of Agriculture (USDA)-funded project and developed an ML-enabled agricultural decision support tool.

## SKILLS AND CERTIFICATIONS

**Technical Skills/Software:** Python, C/C++, Embedded C/C++, Java, MATLAB, SQL, R, CUDA/GPU, Linux Shell/Bash, Git, LaTex, AnyLogic, Visual Studio/Eclipse, TensorFlow/TensorFlow-Lite/TensorFlow-Lite Micro, PyTorch, Jupyter Notebook, Anaconda, Arduino/Raspberry Pi, ARM Processor-Based Microcontroller Unit (MCU)/System-on-Chip (SoC) Programming, Edge/Embedded Machine Learning, TinyML, Deep Learning, Reinforcement Learning, Mathematical Optimization, Algorithm Design, Agent-Based Simulation Modelling, Robot Operating System 2 (ROS2).

**Certifications:** Responsible Conduct of Research and Scholarly Activity Certificate of Training, University of New Hampshire, Durham, NH, USA (2018).

## MISCELLANEOUS

**Journal Reviewer:** IEEE Internet of Things (IoT) Journal; IEEE Access Journal

**Student Membership:** Vice President (Administration), Bangladeshi Students' Association at The University of New Hampshire (BSA UNH); Student Member, American Geophysical Union (AGU).