

Bingnan Huo

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EDUCATION

Brown University

Providence, RI

Sc.M. Data Science (Expected)

Aug. 2023 – May 2025

- Focus Areas: Reinforcement Learning, Robotics
- Coursework: Deep Learning, Reinforcement Learning, Computational Probability

Bucknell University

Lewisburg, PA

B.S. Statistics, Cum Laude

Aug. 2019 – May 2023

- Independent Research: Medical Image Processing by Computer Vision and Machine Learning
- Coursework: Digital Image Processing, Statistical Modeling, Advanced Linear Algebra, Real Analysis, Operations Research, Developmental Psychology, Sociological Theory

PUBLICATIONS

[3] **Huo, B.**, De Mello Koch, A., Akbulut, M.T., Lee, K., Yang, Y., Bagaria, A., & Konidaris, G. “Learning Transferable Sub-goals For Robotic Skills”, *Robotics: Science and Systems (RSS)*, (to be submitted) (2025).

[2] De Mello Koch, A., Bagaria, A., **Huo, B.**, Allen, C., Zhou, Z., & Konidaris, G. “Learning Transferable Sub-goals by Hypothesizing Generalizing Features”, *International Conference on Learning Representations (ICLR)*, (submitted) (2025).

[1] **Huo, B.**, Buffinton, K., Stough, J., & Gadre, A. “Facial Nerve Paralysis Severity Grading by Computer Vision and Machine Learning”, *Susquehanna Valley Undergraduate Research Symposium (SVURS) First Place Best Poster*, Danville, PA, USA (2022).

RESEARCH

Intelligent Robot Lab, Brown University

Oct. 2023 – Present

Advisor: George D Konidaris

- Advisee of Prof. George Konidaris, researched on **option generalization** under Hierarchical Reinforcement Learning framework, for purpose of **learning reusable skills** with application in **robotics**.
- Collaborated with PhD students on paper submitted to *ICLR 2025*, on **learning transferable subgoals** as option termination classifiers; implemented, tuned, and evaluated classifier models with experiments.
- Leading project on applying transferable subgoals with motion planning to **robotics** for reusing and **generalizing skills** across tasks; implemented classifiers, designed experiments, tested on Franka Emika Panda with ROS.

Independent Research, Bucknell University

May 2022 – Dec. 2022

Advisors: Joshua Stough, Keith Buffinton, Arun K Gadre

- Research project on Medical Image Processing by **Computer Vision** and **Machine Learning**, developed a Python backend for diagnosing Facial Nerve Paralysis (FNP) patients with 80%+ accuracy.
- Processed unstructured image dataset, applied image processing techniques to standardize unstructured data and augmented data for machine learning (ML) model training.
- Trained ML models (Random Forest, SVM, XGBoost) and cross-validated performance.

AWARDS & HONORS

- **Pi Mu Epsilon** National Honorary Mathematics Society
- **First Place**, Best Poster, *Susquehanna Valley Undergraduate Research Symposium* (2022)
- **Dean's List**, Bucknell University

COURSE PROJECTS

Reinforcement Learning Project, *Identifying Skills through Policy Similarity*

- Implemented and evaluated methods for grouping subtask policies into skills, by computing policy distribution divergence (KL) and policy similarity metric (PSM) between policies.
- Evaluated methods in Minigrid DoorKey environment, in conjunction with our project on learning transferable sub-goals as option termination classifiers, under Hierarchical RL framework.

Deep Learning Project, *Generative Models Training from Scratch*

- Implemented decoder-only Transformer and conditional Generative Adversarial Network (GAN) models from scratch, trained on videogame data to generate video game description text and images.

Data Science Project, *Classifying Company Industries By Fundamentals*

- Implemented full pipeline data cleaning, processing, visualization, and model training for classifying companies based on their fundamentals; used BayesSearch to tune model hyperparameters.

Data Visualization Project, *Used Car Listings Data Story*

- Processed large scale (850k+ samples) used car listing data, created visualizations with ggplot2 & plotly.
- Published interactive dashboards website demonstrating market trends and pricing factors.

INTERSHIPS

Baidu, Inc.

Beijing, China

Strategic Product Manager Intern

Jun. 2023 – Aug. 2023

- Analyzed competitors' content recommendation strategy, and authored product requirement documents and feature specifications.
- Conducted A/B testings to improve content recommendation strategy of Baidu Mobile APP.

Strategy and Planning Analyst Intern

Jun. 2021 – Aug. 2021

- Conducted market competitive analyses, synthesized industry research reports, analyzed competitor financial reports.
- Presented actionable strategy recommendations backed with data-driven insights and visualizations to leadership team with slide deck presentations.
- Designed surveys and conducted domain expert interviews for evaluating market opportunities and risks.

UNDERGRADUATE SERVICE & ACTIVITIES

Bucknell Chinese Students and Scholars Association (CSSA)

Outreach Coordinator

Mar. 2020 – Aug. 2022

- Secured \$4,000+ in annual sponsorships through negotiations with local businesses.
- Organized 5+ campus events with 100+ attendees each.

Bucknell Outdoor Education and Leadership

Trip Leader

Aug. 2021 – May 2022

- Led outdoor excursions with 20+ participants, fostering team collaboration and safety awareness.

SKILLS & TOOLS

Programming Languages: Python, R, Java

Machine Learning: PyTorch, TensorFlow, scikit-learn, gym

Data Analysis & Visualization: Pandas, SQL, Spark, Matplotlib, Plotly, ggplot2

Other Tools: ROS, Git, Linux, SPSS, SAS

Languages: Chinese (native), English (fluent), Spanish (beginner), ASL (beginner)