Patrick Feeney

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EDUCATION

Tufts University, Medford, MA   **2020 - Present**
- Computer Science Ph.D. Candidate, Advisor: Prof. Michael C Hughes
- Thesis Title: Noise Contrastive Estimation for Supervised Learning and Generalized Category Discovery
- Master of Science in Computer Science, 2023

University of Rhode Island, Kingston, RI   **2016 - 2019**
- Bachelor of Science in Computer Science and Bachelor of Arts in Mathematics
- GPA 4.0, Dean's List, Honors Society

RESEARCH EXPERIENCE

Research Assistant at Tufts University   **2020 – Present**
Deep Computer Vision Methods
- Developing novel contrastive deep learning methods for supervised learning and category discovery
- Identified challenges for applying novelty localization and category discovery models to real data

Deep Learning Novelty Detection, Funded by DARPA
- Produced NovelCraft dataset to benchmark deep learning methods for visual, symbolic, and multimodal novelty detection on complex scenes, utilizing scene reconstructions for automated visual label generation
- Coauthored paper with multiple teams on a framework to combine symbolic planning, reinforcement learning, and deep visual novelty detection to produce AI agents robust to changes in environment

Digital Humanities
- Collaborated with historians on data mining and visualization systems for ancient Roman letters

Vision Engineer at Vision Systems, Inc.   **2019 - 2020**
- Coauthored and orally presented research published through IEEE AIPR 2019 on 3D position estimation of pedestrians from video without knowledge of camera position or rotation; Funded by DARPA
- Developed reinforcement learning method for creating cleaner probabilistic voxel reconstructions
- Created particle filter models utilizing projective geometry for satellite pose regression

Student Technology Assistant at University of Rhode Island   **2018 - 2019**
- Created hurricane modeling software written in Python and R with ocean engineering Ph.D. students
- Led development of multiple VR applications to research the use of VR in classes for undergraduates
- Developed websites for research data collection and K-12 education to meet the needs of external teams

HIGHLIGHTED PUBLICATIONS

SINCERE: Supervised Information Noise-Contrastive Estimation Revisited
Patrick Feeney and Michael C. Hughes
arXiv preprint, 2023

NovelCraft: A Dataset for Novelty Detection and Discovery in Open Worlds
Patrick Feeney, Sarah Schneider, Panagiotis Lymperopoulos, Liping Liu, Matthias Scheutz, Michael C Hughes
Transactions on Machine Learning Research, 2023

Evaluating the Use of Reconstruction Error for Novelty Localization
Patrick Feeney and Michael C. Hughes
ICML 2021 Workshop on Uncertainty & Robustness in Deep Learning, 2021

SKILLS

- Applying math and statistics to deep learning, computer vision, and data visualization
- Developing applications in Python, C++, C#, C, JavaScript, PHP, Java, R, Fortran, and more languages
- Utilizing DevOps practices: virtualization, automated building and testing (CI/CD), and version control