Benjamin Molloy

518-223-2085 | benrmolloy@gmail.com

EDUCATION

CLARKSON UNIVERSITY
BS in Computer Science
Minor in Robotics
Minor in Mathematics
3.314 GPA
May 2023 | Potsdam, NY

COURSEWORK

UNDERGRADUATE
Deep Learning
Probability & Statistics
Computer Graphics
Computer Vision
Robotics
Software Design & Development
Multi-Modal System Design
Human Robot Interaction

SKILLS

PROGRAMMING
Proficient
- C++
- Java
- Python
- MATLAB
- R

Familiar
- SQL
- HTML
- CSS
- JavaScript

EXTRACURRICULAR

CLARKSON UNIVERSITY
SPEED Team
- Timber Bridge Project
- Treasurer

Outing Club
- Officer
- Pre-Orientation Leader

Climbing Wall
- Route Setter
- Instructor

RESEARCH

TERASCALE ALL-SENSING RESEARCH STUDIO | Researcher
Jan 2021 - May 2023 | Potsdam, NY
Robotic Handover Project
- Performed multi-camera calibration of a 12-camera system consisting of thermal, depth, and high-speed color cameras. Used a traditional checkerboard to perform calibration across the depth and color cameras. Used a bi-material checkerboard to calibrate the thermal and color cameras by pre-heating the checkerboard to reveal the checkerboard pattern on the thermal cameras.
- Completed CITI training for human subject studies and ran a large-scale human subject data collection for understanding human to human handover interactions. Collected data with 32 human subjects interacting with over 200 household objects. Resultant dataset consisted of 3,264 human to human handover interactions.
- Assisted graduate students in painting and scanning real world objects to prepare the 200+ object dataset for the human subject studies. Objects were painted white to minimize noise generated by IR reflections on metallic objects.
- Performed data annotation to enable alignment of scanned 3D models to point clouds generated by the depth cameras. Performed annotation to mark key frames in scenes to identify sender grasp, receiver grasp, and receiver release. Performed hand annotation to enable segmenting of sender and receiver hands in the human to human interaction scenes.

Broken Object Repair
- Gathered, organized and labeled a collection of 300+ objects to aid in construction of a robust dataset of complete and damaged models of common household objects. Conducted controlled breaking of objects to gather complete and damaged model pairs for each object, resulting in over 15 classes of objects and 5 methods of breaks across the dataset.
- Prepared and scanned dozens of real world objects, as well as provided instruction and guidance to other undergraduate researchers on scanning procedure to assist the building of the dataset.
- Aided in preprocessing steps of object models, including mesh simplification, orienting, model cleaning, repairing, and more. Resultant dataset consisted of over 100 complete-damaged model pairs of common household objects.

LEADERSHIP

NATIONAL OUTDOOR LEADERSHIP SCHOOL
June - July 2017 | Wind River Range, WY
Attended a 30 day backpacking and rock climbing course in a remote, backcountry environment while developing personal and leadership skills. Designated as one of two students to lead the group, without NOLS leaders, back into the frontcountry.

PUBLICATIONS

[1] N. Lamb, C. Palmer, B. Molloy, S. Banerjee, and N. K. Banerjee. Fantastic breaks: A dataset of paired 3d scans of real-world broken objects and their complete counterparts. In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.