Nikolas **Lamb**

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Education

Doctor of Philosophy in Computer Science, Clarkson University *2021 - 2024 (anticipated)*

Bachelor of Science in Computer Science with Minor in Mathematics, Clarkson University *2015 - 2019*

Advisors: Natasha Kholgade Banerjee (CS) and Sean Banerjee (CS)

Recent Publications

***Lamb, N.**, Wiederhold, N., Lamb, B., Banerjee, S., & Banerjee, N. K. (2021). Using Learned Visual and Geometric Features to Retrieve Complete 3D Proxies for Broken Objects. In Symposium on Computational Fabrication (pp. 1-15).*

***Lamb, N.**, & Banerjee, N. K., & Banerjee, S. (2019). Automated Reconstruction of Smoothly Joining 3D Printed Restorations to Fix Broken Objects. In Proceedings of the ACM Symposium on Computational Fabrication (p. 3). ACM.*

***Lamb, N.**, & Chuah, M. C. (2018). A Strawberry Detection System Using Convolutional Neural Networks. In 2018 IEEE International Conference on Big Data (Big Data) (pp. 2515-2520). IEEE.*

***Lamb, N.**, Banerjee, N. K., & Banerjee, S. (2018). Programmatic 3D printing of a revolving camera track to automatically capture dense images for 3D scanning of objects. In International Conference on Multimedia Modeling (pp. 390-394). Springer, Cham.*

Research Experience

Graduate Researcher, Clarkson University *Spring 2021 - Current*

- Developing algorithms to fully automate repair of fractured household objects using machine learning, submitted to CVPR.
- Published an algorithm at SCF to obtain complete objects to repair input broken objects by searching in a database.

Graduate Researcher, Lehigh University *Fall 2019 - Fall 2020*

- Wrote a grant for and led development of a 6DoF robotic arm with custom hardware, 3D-printed parts, API, simulator, and ROS integration.
- Developed ROS navigation stack with high level task manager for Ohmni telepresence robot, augmented with my robotic arm.

Undergraduate Researcher, Clarkson University *Spring 2017 - Spring 2019*

- Developed and published an algorithm to automatically produce smoothly-joining 3D-printable restoration parts for broken objects.
- Designed structure-from-motion based automatic 3D scanner, which is parametric and can be 3D printed, using Python, OpenSCAD and Matlab.
- Managed research group in synthesizing 957 high point density 3D models using my 3D scanner to optimize scanning procedure.
- Generated reconfigurable platonic solid calibration targets in OpenSCAD, to enable quicker calibration of multi-camera systems.

Undergraduate Researcher, Lehigh University *Summer 2018*

- Trained neural network to detect strawberries in Python that achieves 84.2% accuracy at 1.63FPS and can be deployed for under $50.
- Collaboratively developed a Python API for a robot arm to automatically pick strawberries using my neural network.

Leadership Experience

Undergraduate and Graduate Researcher, Clarkson University *Spring 2017 - Current*

- Mentoring 1st year PhD student to create multi-camera capture API for synchronization, capture, and analysis of RGB, thermal, and ir data.
- Mentoring 2nd year PhD student to design more efficient algorithms to encode symmetry of 3D models using deep neural networks.
- Mentored an undergrad to generate 3D temporal pointclouds from RGB, thermal, and ir multi-camera systems, and perform 3D model registration.
- Mentored an undergrad in the design of a mobile robotic base to observe elderly patients, anticipate fall risk, and intercept falling patients.

Makerspace Supervisor, Clarkson University *Fall 2018 - Spring 2019*

- Worked with interns to structure and staff Business Plan Competition, President's Challenge Kickoff, and President's Challenge Workshop Series.
- Guided purchasing of approximately $50,000 worth of equipment for on-campus Makerspace, and assembled and maintained this equipment.
- Assisted with and contributed to staff interviews for open department positions and student interviews for mentor positions.

Industry Experience

Engineering Intern, Qualcomm San Diego *Summer 2019*

- Quantized and optimized existing neural networks for deployment on state-of-the-art Qualcomm handset devices.
- Developed a software API in Python to convert neural networks to a proprietary format and execute them on Qualcomm handset devices.

Skills

Programming Python, MATLAB, C++, C, Bash, Latex, HTML, Java, JavaScript

Packages PyTorch, Tensorflow, ROS, WebGL, Open3D, OpenCV, NumPy, Pandas

Software Adobe AfterEffects, Fusion360, Trimble Sketchup, OpenSCAD, Maya, Unity, Blender

Awards

2019 **NSF Graduate Research Fellowship,** Recognizes and supports outstanding graduate students. *NSF*

2019 **President's Challenge Grand Prize,** For open-source *Makerspace Utilization* project. *Clarkson University*

2019 **Arts and Sciences Award,** Shows significant interdisciplinary scholarship and excellence in communication. *Clarkson University*

2019 **Hamlin/Darraugh Award,** Senior who has made outstanding contribution to computer science. *Clarkson University*

2018 **R. Gerald Bradshaw Award,** Junior who has made outstanding contribution to computer science. *Clarkson University*