Russell Newton

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Education

Doctor of Philosophy in Architecture — Georgia Institute of Technology (August 2024 to May 2025)
Incomplete
Concentration: Design Computation

Master of Science in Computer Science — Georgia Institute of Technology (January 2023 to May 2024)
GPA: 4.0/4.0
Concentration: Computer Graphics

Bachelor of Science in Computer Science — Georgia Institute of Technology (August 2020 to December 2022)
Graduated with Full Honors (GPA: 3.87/4.0)
Concentrations: Artificial Intelligence and Modeling & Simulations

Skills

Languages:	Python, C/C++, JavaScript, C#, Java, GLSL, HLSL, MySQL
Frameworks & Tools:	Unreal Engine, Unity, React, Node.js, Windows, Linux, Computer-Aided Design
Applications:	Multithreaded/Concurrent Programming, Parallel Processing, GPU Programming, Computer Graphics, Computational Geometry, Computer Vision, Machine Learning, Optimization, Legacy Modernization, Full-Stack Development
Automation & CI/CD:	Docker, GitHub Actions, Jenkins, Playwright
Mathematics:	Linear Algebra, Multivariable Calculus, Differential Equations, Statistical Modeling
Interpersonal:	Leadership, Communication, Project Planning/Execution, Instructing, Mentoring

Experience

August 2023 to Present: Graduate Research Assistant, Shape Computation Lab, Georgia Tech — Atlanta, GA
Leading development on Shape Machine, a shape grammar interpreter that operates within McNeel's Rhino 8. Rewriting dense, undocumented legacy code with modern design patterns and strategies such as dependency injection. Optimizing novel computational geometry algorithms. Creating features that improve end-user experience and introduce new functionality. Leading development of Shape Machine's dedicated website.

January 2023 to May 2023: Graduate Teaching Assistant, Georgia Tech — Atlanta, GA
Specifically requested by the professor to be a GTA for CS 4510: Automata & Complexity. Requires strong understanding of course topics: languages, deterministic and nondeterministic finite automata, regular expressions, grammars, Turing machines, and runtime and space complexity analysis and reductions.

June 2022 to December 2022: Software Engineering Intern, ScienceLogic — Reston, VA
Worked to improve data collection for an IT Operations infrastructure platform. Restructured, improved, and tested old code to improve product longevity. Developed utilities to easily switch between Python interpreters and imported members mid-execution. Praised by team for ability to work well under pressure and to learn and adapt quickly.

January 2022 to May 2022: Undergraduate Teaching Assistant, Georgia Tech — Atlanta, GA
UTA for CS 3510: Design and Analysis of Algorithms. Required strong understanding of course topics: divide-and-conquer, dynamic programming, and graph algorithms; and runtime and space complexity analysis and reductions.

Publications

R. Newton and A. Economou, "Redefining Line Maximization," in *Design Computing and Cognition'24*, vol. 1, Springer, Cham, Sep. 2024, pp. 250–264. doi: 10.1007/978-3-031-71918-9_16.

A. Economou, T.-C. K. Hong, and R. Newton, "Shape Meets Euclid: Integrating Shape Computation With Ruler and Compass Procedures," *Automation in Construction*, vol. 165, p. 105562, Jun. 2024, doi: 10.1016/j.autcon.2024.105562.

Project Spotlight

Shape Machine | Website
Shape Machine is a shape grammar interpreter that operates as a plugin in McNeel's Rhino 8 that leverages the vector-based representations of geometry within a CAD environment to search for shapes within a design and replace them with new ones. Beyond interpreting and applying individual shape replacement rules, Shape Machine can interpret DrawScript, its very own Turing-Complete programming language where shapes become code. Visual programming with DrawScript enables a radical new approach to computation.

Project Abyss (Concept Game)
Lead developer for a co-op arena shooter created as a concept pitch for the Savanna College of Art and Design VGDev Senior Capstone. Worked with artists to incorporate models, VFX, and SFX into the demo. Created enemy AI, weapons, and custom network-replicated movement.
Served in an advisory capacity towards the creation of the game created for the Senior Capstone based on the pitch, Mind the Abyss (Steam Page).

Project L Style Mimic | Public (no code) GitHub | Source Code (requires Unreal Engine source access to view)
An attempt at recreating the shading style of characters in Riot's upcoming fighting game, 2XKO, from when it was referred to as Project L. Involved modifying several parts of Unreal Engine's deferred renderer to introduce a new stylized shading model.

MultiTouch | GitHub | Website
With four other students, created a low-level multitouch gesture recognition library in C for L3Harris. Created the tech demo using Emscripten to interface between the Vue frontend and the C library. Created interface to identify repeated taps (double tap, etc.) and to link common touch events. Commended by client for leadership and communication skills.

TikTokPy | GitHub | PyPI | ReadTheDocs
A TikTok data scraping library built with Playwright and Pydantic. Built with feedback and contributions from users.

Not Malware Game | Game Page (itch.io)
Lead the development of an original dungeon-crawler with four other students for GT CS2340: Objects and Design. Recognized by the professor and class as one of the best three games out of the 114 for the Spring 2021 semester.

Leadership

August 2021 to December 2023: Georgia Tech *Rainbow 6: Siege* Team Representative Atlanta, GA
Maintaining the GTR6 community by organizing meetings and matches, coordinating with GT Esports's staff, and strengthening coordination and communication between team members.

August 2016 to May 2020: FIRST Robotics Competition Team 2974 Marietta, GA
Participated as an influential programmer, including one year as Lead Programmer, for Walton High School's FRC team. Co-developed a motion profiling library recognized by several world-class teams for reliability. Created a tool that interpolates data with 2 degrees of freedom with Delaunay triangulation, used for 3+ years. Praised by coach and mentors for leadership and communication skills.

July 2019: Eagle Scout, Boy Scout Troop 795 Marietta, GA
Conceptualized a personal community service project with the National Park Service over the course of two months and led several volunteers in the removal and replacement of a bridge at a local hiking trail. Participated in National Youth Leadership Training and held various troop-level leadership roles.