

Samuel Lensgraf

🏠 samlensgraf.com

Education

B.S. in Mathematics and Computer Science

New Orleans, Louisiana

TULANE UNIVERSITY

Aug. 2011 - May. 2015

- Capstone project in spatial decomposition datastructures.
- Capstone project in toolpath generation techniques for CNC mills and FFF printers.
- Graduated cum laude.

Publications

An Improved Toolpath Algorithm for Fused Filament Fabrication

Singapore, Singapore

THE IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION

May. 2017

- Designed and implemented a local search algorithm that uses a variety of solution cost metrics to produce very efficient toolpaths.
- Rigorously showed that the solutions produced by this algorithm were nearly optimal in some real world cases.
- Created a novel Linear Programming based formulation of tool path generation for FFF printers that produces instance specific lower bounds on solution quality.
- Implemented the formulation using Gurobi and successfully solved several instances of the problem derived from real world tool paths.

Beyond Layers: A 3D-Aware Toolpath Algorithm for Fused Filament Fabrication

Stockholm, Sweden

THE IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION.

May. 2016

- Awarded **Best Automation Paper**.
- Created a novel paradigm for the tool path generation process for FFF 3D printers that allows printing on multiple planes at once while maintaining safety guarantees.
- Implemented this novel paradigm using c++ and successfully used the implementation to optimize tool paths for models of varying geometry.

Experience

Researcher: Process Optimization for Additive Manufacturing

Chattanooga, Tennessee

INDEPENDENT

May 2015 - PRESENT

- Under the guidance R. Mettu of Tulane University, design and theoretically analyze novel tool pathing algorithms that allow faster printer operation.
- Primary inventor on process patent filed by Tulane University and two publications presented at the IEEE International Conference on Robotics and Automation.
- Create efficient implementations of the algorithms in c++11 that scale easily to very large data sets.
- Implemented a REST frontend to provide an intuitive interface for the codebase using React.js, THREE.js and Python.

Software Engineer

Chattanooga, Tennessee

BELLHOPS

Jun. 2015 - PRESENT

- Design and implement workforce automation algorithms that automatically build work schedules for Bellhops service providers, saving hundreds of employee hours.
- Extend availability reporting infrastructure to allow real time, accurate snapshots of supply used in a variety ways throughout the business.
- Redesigned and built a new availability management backend that enabled increased reliability of service provider availability data.
- Extend the core data modeling layer of the Bellhops web infrastructure to improve data collection during customer and internal interactions.
- Acted as sole maintainer of the marketing frontend React.js app used by hundreds of customers daily for two months.
- Created AWS cloud infrastructure automation scripts during the company push to leave a managed infrastructure provider.

Teaching Assistant: Computer Science

New Orleans, Louisiana

TULANE UNIVERSITY

Aug. 2013 - May. 2015

- Assisted students with assignments and provided guidance on fundamental concepts in Computer Science in Intro to Computer Science 1 & 2.
- Educated students in numerous programming languages including python, java, and c++.
- Held well attended weekly help sessions.
- Graded exams, and weekly homework assignments.

Skills

- C++ Development** Experience implementing novel algorithms at multiple levels of abstraction.
- Python** Experience developing production web apps used by thousands of users daily.
- Teamwork** Work with teams consisting of diverse mindsets to solve complex problems.
- Frontend Web Development** Experience maintaining production web frontends.