

Software Engineer

Multi-Talented Engineer. Experience Delivering Immediate Technical Solutions with Long-Term Strategic Impact.

Education & Certifications

BS, Engineering (2008) – Harvey Mudd College

PE, Mechanical (2012) – Board for Professional Engineers & Land Surveyors

MBA (Expected 2022) – Washington State University, Carson College of Business

Technical Proficiencies

Software	Backend	Python, nodeJS, OpenCV, SQL, Linux, C/C++, MongoDB.
	Frontend	React, AngularJS, JavaScript, HTML, CSS. REST, Socket IO, MQTT.
	Tools	Git, Bash, JIRA. PyCharm, Atom. Raspberry Pi, Arduino, IoT Devices.
Mechanical	Design	SolidWorks, Inventor, PTC Creo, Blender, DFM, Tolerancing, BOM Structure.
	Analysis	Static, Dynamic, Thermal, Fluids Modeling, Simulation FEA, FMEA, FTA.
	Technology	3D Printing, Machining, Sheet Metal, Injection Molding, Elastomers, Coatings.

Work Experience

HEWLETT-PACKARD – Writing Systems Software Engineer 3D Printing (2016 - Present)

- Prototype to Production Product Lifecycle Development Experience for the MJF 580/380 Series Full Color 3D Printers.
- Deployed Edge 3D Printer Diagnostics SDK and API (Python) to process raw data sources into mission critical performance metrics.
- Created core thermal camera data refinement algorithms (Python, OpenCV) used to create advanced diagnostic analysis routines.
- Created core visual camera refinement algorithms enabling detection of defects using conditional image-processing procedures.
- Created augmented in-printer thermal control process calibration by releasing a heuristic-based data validation system (Python).
- Developed a (React JS) dashboard for monitoring live data streams (MQTT) from networked 3D Printers and wireless sensors.
- Migrated over 49000 lines of code from Python 2 to Python 3. Integrated and revised code from several adjacent teams.
- Developed mechanical designs for powder reclamation system. Developed data acquisition systems for process QA.

AUTODESK – Senior Software Engineer (2014 - 2016)

- Aggregated and refined marketing data from suppliers to build a database (MongoDB) of consumer-grade FDM materials
- Created a software utility (nodeJS) used to translate existing print profile configuration settings into a proprietary format.
- Created drivers (nodeJS) for asynchronous USB and Serial communication for consumer grade 3D printers.
- Research and development projects extending FDM 3D printer technology capabilities.

COOPER LIGHTING – Manufacturing & Sustaining Engineer (2012 - 2014)

- Generated over \$100K in annual savings through focus on design information tools while supporting shop floor.
- Created ECR/ECO/ECN system used to more efficiently coordinate between design, fabrication, and purchasing departments.
- Deploying design-engineer facing software systems used to ensure consistent BOM, finishing, and assembly structure.
- Produced approx 100 electromechanical designs per month for standard and customized architectural lighting products.

SUNPOWER CORPORATION – Product Development Engineer (2009 - 2011)

- Performed analysis on wind-tunnel data to enable permissible use with US and EU commercial rooftop codes.
- Extended two products into European markets through rigorous analysis, qualification testing, and documentation.
- New product qualification for a building-integrated residential photovoltaic product by using HALT and load testing.
- Secured one patent grant for a fire-blocking barrier mechanism while designing for SunPower's product portfolio.

COOL EARTH SOLAR – R&D Mechanical Engineer (2008 - 2009)

- Design, analysis, prototype, test, and data reduction for mechanical, thermal, and optical solar photovoltaic components.
- Design and integration of tracker support frame, concentrator restraint mechanisms, and jet impingement heat exchangers.

Continued...

Presentations & Tradeshows

RAPID + TCT 2017: Improving Industrial 3D Printing with MRP Integration, Big-O Analysis, and Generative Geometry

In this presentation I described the benefits of using a business integrated 3D printing software solution to reduce waste, overburden, and unevenness in small to medium sized companies by leveraging qualities intrinsic to additive manufacturing.

3D Printed Violins Made Using the HP MJF 580 Series Functional Color Production System - [LinkedIn](#) - [YouTube](#)

This is a rogue marketing video I produced as part of an ongoing development project to prove the capability of the HP MJF Functional Color 3D Printer. The (unreleased) new design modifications are providing overwhelming positive reception. Contact me if you are interested in a preview.

Patents & Disclosures

Active Fire-Blocking Wind Deflector - US 8763316 B2

A rooftop photovoltaic component affording two configurations: a default mode acting as a pressure equalizing wind deflector, and a second mode triggered in the event of a building fire. The second mode attenuates the propagation rate of the fire, an important quality to satisfy Class A fire rating test requirements for rooftop integrated photovoltaics.

Controllable Release Build Plate For 3D Printer - US 20170190120 A1

A fused filament fabrication technology component with integral features that enable automated thermo-electro-mechanical selective attachment and detachment of 3D printed parts.

Build Material Spreaders - WO2019139594A1

A powder spreading apparatus comprised of a rotating roller with transverse method of action in order to fill a fixed depth void. The roller has sections at either end with diameter less than the medial portion in order to modify the density of powder surface.

Build Material Retaining Wall - WO2019027434A1

A powder-bed 3D printing layer creation component used at the end of powder spreader travel used to contain and recycle excess material generated through high inertia imparted to powder through the spreading process.

Vacuum-Assisted Incidental Build Material Collection with Receptacle in Three-Dimensional Printer - WO2019027431A1

A powder-bed 3D Printing powder layer creation system designed to control and contain incidental scattered powder particles. The system utilizes one or more vacuum sources to create negative pressure zones that draw in and contain scattered powder.

Thermal Characteristic Control in a Build Material - WO2019236050A1

An automated system determines an object part density relative to a build region in a layer of build material in a 3D printer. The system provides control over delivery of energy-absorbing agents in order to ensure thermal equilibrium within desired window.

Adjustments Based on the Age of Fusing Agents - WO2020023048A1

An automated system controls quantity of energy-absorbing agents delivered based on characterized decay rates for agent degradation as a function of time.

Automated Conveyance of Articles in Chemical Vapor Processing, Conveyance & Interlock - 700236198WO01

System necessary to enable continuous processing of 3D printed components when using chemical vapor part finishing. The system introduces servo-controlled interlock and conveyance mechanisms with a coordinating computer system based on part material finishing requirements.