Shashank H R

shashankhr.com | linkedin.com/in/shashankhr1
me@shashankhr.com | +1 404 915 5715
175 W St James st Unit 504, San Jose, CA 95110

Materials Scientist/Engineer with expertise in Additive Manufacturing and experience in Product and Process Engineering.

Education

University of California, Berkeley | GPA: 3.94/4 | Berkeley, CA, USA **August 2016 – May 2017**
Master of Engineering in Materials Science and Engineering | Concentration: Advanced Structural Materials

Indian Institute of Science | GPA: 7.4/8.0 | Bangalore, India **August 2012 – May 2016**
Bachelor of Science in Materials | Awarded *The Institute Medal* for exceptional academic performance | Class position: 1st of 30

Technical Skills

(More at shashankhr.com/skills)

Techniques in Materials Science
Microscopy (Optical, SEM, EDS, TEM), LECO C&S, Microhardness, UTM Mechanical Testing, and more

Scientific Tools
Wolfram Mathematica, Python, Thermo-Calc, JMP, LaTeX, Matlab

CAD and Design Tools
Solidworks, Adobe InDesign, Illustrator and Photoshop

Relevant coursework

(More at shashankhr.com/courses)

- Materials, Manufacturing, and Design
- Mechanical Behavior of Materials
- Microstructural design and Development of Engineering Materials
- Electron Microscopy and Characterization
- Mechanical Properties (lab course)
- Probability and Statistics
- Thermodynamics and Kinetics
- Phase Transformations
- Computational Materials Science
- Solidification Processing
- Science of Materials Processing
- Mechanics of Solids
- Algorithms and Programming

Work Experience

Velo3D | Senior Process Engineer | Campbell, CA, USA **June 2021 – Present**
A member of the Process Team at Velo3D, a manufacturer of metal 3D printers with proprietary SupportFree™ technology

Gantri | Senior Materials Engineer | San Francisco, CA, USA **May 2020 – June 2021**
Sole Materials Engineer at Gantri, a producer of designer articles using 3D printing of sustainably sourced materials.

- **Process engineering:** Led print process development at the production facility, sporting one of the largest fleets of FDM 3D printers. Additionally, I worked with vendors to specify and control incoming feedstock, for end-to-end process control.
- **Recycling and sustainability:** Pioneered and lead efforts with external vendors for shredding and recycling of waste material from production into new feedstock. This material will be used for internal components, where diminished properties are acceptable.
- **New material and process discovery:** Explored and developed new material systems and finishing processes that can potentially improve product quality, surface finish, and yield, while increasing productivity and reducing carbon footprint and labor costs.

Chefman | Product Development Engineer | Mahwah, NJ, USA
Full-time **February 2020 – April 2020**
Part-time | Remote **April 2020 – September 2020**
The team builds new products while working closely with contract manufacturers in Asia throughout the design process.

- **New product development:** Competitor benchmarking, prototyping, simulation and experimental evaluation of design, and materials selection for structural components and coatings. This includes Design Failure Mode and Effect Analysis (DFMEA).
- **Collaborating with offshore contract manufacturers:** Review initial specifications, write test plans, perform validation testing on samples, and specify changes to ensure requisite performance and compliance with specifications before mass-production.
- **Failure analysis and sustaining engineering:** Work with the Customer Support department to identify top failures on returned malfunctioning products, perform failure analysis, and roll out changes before the next batch is mass-produced.

Desktop Metal | Materials Engineer | Burlington, MA, USA **June 2017 – December 2019**

A member of the Materials team at Desktop Metal, a manufacturer of office-friendly metal and composite 3D printers.

- **New alloy development:** Led powder specification, sintering process development, microscopy and microanalysis, and Design-of-Experiments and statistics-backed process qualification for the development of five materials for the Studio System™ (including Stainless Steels, Tool Steels, low-alloy steels, and Ni-based superalloys).
- **Development of materials processing equipment:** Worked closely with the hardware and applied science teams in the development of the Studio System™ furnace, one of the smallest vacuum furnaces capable of sintering stainless steels.
- **Post-processing:** Developed and qualified post-processing techniques such as heat-treatment, case hardening, nitriding, and mechanochemical surface finishing of additively manufactured parts with partner vendors.
- **Material science-based solution development:** Developed the getter system, which provides an atmosphere of required purity and allows sintering of certain sensitive materials on the low-cost Studio System™ furnace.
- **Expertise and knowledge sharing:** Provided technical expertise to customer-facing teams and helped develop content for the Desktop Metal Knowledgebase, a platform to make internal best-practices available to external users.
- **Select other projects:** Geometry accuracy and compensation (USPTO application US20180307209A1), toolpath planning, development of infrastructure to store experimental data (including IoT-based equipment logging).

GE Global Research | Manufacturing and Materials Technologies | Internship | Bangalore, India **May – July 2014**

Title: Investigation of recrystallization due to compression straining in Ni-based superalloy GTD 444

- Gained familiarity in Ni-based superalloys, particularly Single Crystal (SX) and Directionally Solidified (DS) superalloys.
- Performed systematic metallographic analysis and analyzed the micrographs using image processing techniques.

Research Experience

(More at shashankhr.com/research)

University of California, Berkeley | Capstone Project | Berkeley, CA, USA **August 2016 – May 2017**

Title: Improving Reliability of 3D Printed Materials in Biomedical Applications

- Performed mechanical testing of additively manufactured metal parts in mildly corrosive environments and employed fractographic methods to understand the causes and modes of failure. The information was used to develop design guidelines for additively manufactured biomedical implants in load-bearing applications, typically for orthopedic use.

Georgia Tech | Direct Digital Manufacturing Lab | Bachelor's Thesis | Atlanta, GA, USA **May – December 2015**

Title: Design-of-Experiment Based Process Optimization for Single-Crystal CMSX-4® Ni-based Superalloy Processed Through Scanning Laser Epitaxy (SLE), a Metal Additive Manufacturing Process

- Setup and independently performed the Scanning Laser Epitaxy (SLE) process, a laser-based powder bed metal additive manufacturing process that can be used to repair damaged tips single crystal Ni-based superalloy parts, such as turbine blades.
- The Design-of-Experiments-based process optimization was followed by characterization, where my expertise with microscopy, metallography, and image processing produced high-resolution micrographs of the processed samples.

Indian Institute of Science | Materials Engineering | Summer Project | Bangalore, India **May – July 2013**

- Studied flow pattern formation due to liquid electromigration and thermomigration in Gallium.
- Worked in nanofabrication and nanocharacterisation facilities. Trained to use an SEM, including modes such as EDS and EBSD.

Publications

Patents and Applications

- Adaptive 3D printing (Granted: US10996652B2, and Application: US20210223757A1)
- Nanoparticle delivery for controlling metal part density in additive manufacturing (Application: US20180236541A1)

Scientific Journals

- Microstructures and Microhardness Properties of CMSX-4® Additively Fabricated Through Scanning Laser Epitaxy (SLE)
  Basak, Amrita, **Holenarasipura Raghu, Shashank** & Das, Suman, Journal of Materials Engineering and Performance (2017) 26: 5877. doi: 10.1007/s11665-017-3008-9