Yasham Amar Mundada

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Education

Pennsylvania State University (PSU) — State College, PA
Master of Science - *Additive Manufacturing and Design*, GPA: 3.97/4.0 — *Aug 2022 - May 2024*
Awards: *Academic Excellence Award 2023, Graduate Fellowship and College of Engineering Scholarship*

Indian Institute of Technology Gandhinagar (IITGn) — Gandhinagar, India
Bachelor of Technology (Honours) - *Materials Science and Engineering* — *Jul 2017 - May 2021*

Professional Experience

Reseach and Development Intern, **EOS North America** *(Austin, TX)* — August 2024 - Present
- Contributed to developing a novel approach for rapid qualification of additively printed parts using in-situ monitoring signals
- Operated EOS M290 metal printer from designing, printing and post-processing of Titanium parts

Materials Design Engineer Intern, **QuesTek Innovations** *(Evanston, IL)* — June 2023 - August 2023
- Developed a novel ceramic coating for turbine blade with Thermo-Calc calculations, achieving 18% better fracture toughness than state-of-the-art coating as determined by Vickers hardness measurement
- Leveraged CALPHAD to identify the 6 best alloys from a database for anode materials of the iron electrolytic extraction process
- Proposed heat treatment strategy for Wire-Arc additive manufacturing of steel by analyzing computed thermal profile

Analyst, **IQVIA** *(Pune, India)* — June 2021 - May 2022
- Developed Alteryx workflows for big data analytics, calculating KPIs for Aimmune, and visualized results in Tableau dashboard
- Recommended strategies by analyzing target physicians, patient history and referral patterns, increasing annual revenue by 13%
- Received *Spotlight Award* for showing strong ownership towards the work and delivering quality client deliverables

Key Research Projects

Failure Analysis and Quality Control of Additively Manufactured Samples (Thesis) — Oct 2023 - May 2024
- Formulated a statistical function to predict failure location in laser powder bed fused (LPBF) AlSi10Mg specimens with 81% accuracy using pore features extracted from image processing (OpenCV) of Computed Tomography (XCT) data
- Validated failure locations through fractography study using optical microscopy on tensile-tested samples
- Linked in-situ photodiode signals collected during printing with mechanical properties and failure location, showing potential for quality control without destructive testing

Direct Ink Writing of Smart Ceramics and Development of Parameter Selection Map — Aug 2022 - Sept 2023
- Engineered a custom 3D printer for high-viscosity ceramics for electronic applications by modifying Ender 3D
- Conducted printability study using Design of Experiments (DoE) to identify optimal material composition of the ceramic slurry and process parameters for porosity and crack-free prints
- Built a COMSOL simulation model of the DIW process to study the effect of process parameters on deposition
- Crafted high throughput parameter selection framework by fusing simulation data with a Machine Learning-powered Gaussian Process model that achieved >92% prediction accuracy with fewer than 20 data points

Design of Microstructure Selection Map for LDED of Al-0.5%Sc-0.5%Si Alloy — Jan 2020 - May 2021
- Remodeled fusion welding CFD FORTRAN code into a program for directed energy deposition (L-DED) process to understand key process variables like thermal profile and validated the model with experimental results
- Simulated LDED process of Al-Sc-Si alloy to extract solidification parameters to predict solidification morphology in printed parts
- Developed Python algorithm to extract microstructure selection map to predict microstructure for LDED of Al-0.5%Sc-0.5%Si alloy with excellent accuracy for diverse operating parameters

Skills and Certifications

Design/Modeling: SOLIDWORKS (3D CAD), nTopology (Topology Optimization), Fusion 360 (Generative Design)
Analysis: Materialize Magics, COMSOL, PanX, Thermo-Calc, Image-J, AVIZO
3D Printers: EOS M290, Prusa, Ender 3D
Material Characterization: Optical Microscopy, Microhardness, Rheology, Metallography
Programming Languages: Python, MATLAB
Other Tools: OpenCV, LaTeX, Alteryx, MS-Office (Excel, Word, Powerpoint), Minitab
Relevant Courses: Design for Additive Manufacturing (DfAM)

Publications

- *Investigation of temperature distribution and solidification morphology in multilayered directed energy deposition of Al-0.5 Sc-0.5 Si alloy. International Journal of Heat and Mass Transfer, 186, p.122492.*
- *Microstructure engineering during directed energy deposition of Al-0.5 Sc-0.5 Si using heated build platform. International Journal of Heat and Mass Transfer, 202, p.123679.*

Leadership and Teaching

Teaching Assistant, PSU
- ME201: Introduction to Thermal Science (300 Students) - (Spring'24 and Fall'23)

Events-Coordinator, Amalthea '18 (Annual Technical Summit), IITGN
- Coordinated a total of 13 technical events and managed a team comprising of 30 members to conduct the events