Steven U. Mamolo

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EDUCATION

PhD in Aerospace Engineering August 2021 to Present

- **University of Michigan**, Ann Arbor, MI
- **Relevant Coursework:** Structural Dynamics, Theory of Elastic Stability, Fibrous Composites, Finite Element Methods, Solid and Structural Mechanics
- **GPA: 4.00**

BS in Mechanical Engineering Graduation Date: May 2021

- **Gonzaga University**, Spokane, WA
- **GPA: 3.80**

RESEARCH EXPERIENCE

Aerospace Materials Laboratory – University of Michigan, Ann Arbor, MI August 2021 to Present

- Improving the interfacial shear strength of carbon fiber composites by 80% through an aramid nanofiber (ANF) interface
- Using novel techniques in direct metal laser sintering to additively manufacture thick-walled and solid tungsten parts

Tribology Laboratory – Gonzaga University, Spokane, WA January 2020 to May 2021

- Fabricated low friction polymer nanocomposite filaments using a Filabot EX2 filament extruder for use in FDM 3D printing
- Characterized friction and wear of 3D printed polymer nanocomposites with a custom reciprocating wear tester
- Utilized novel dynamic techniques in Atomic Force Microscopy (AFM) to quantitatively probe nanoscale topography and local elastic and viscoelastic properties of polymer transfer films
- Developed standard operating procedures for a new state-of-the-art AFM (Asylum MFP-3D Origin+), so future student researchers could safely and effectively utilize the instrument
- Self-taught AFM operating and data analyzation system (AR V16), and trained rest of team including management on processes and functions

WORK EXPERIENCE

Physics Lab TA – Gonzaga University, Spokane, WA August 2019 to May 2021

- Assisted students and answered questions during weekly physics I and II labs
- Performed the final check on lab students' understanding of that week's material
- Graded lab reports clearly and consistently

Process Improvement Engineer / Intern – All Metals Processing, Stanton, CA May 2019 to August 2019

- Operated three SLA 3D printers to increase production of masking nubs for an anodization process, bringing weekly production from 1200 to 3000 (250% increase)
- Designed (SolidWorks) and manufactured (SLA 3D printer) a blade holder that accurately and repeatably cuts masking to a thin 0.005 inch tolerance, increasing quality, reducing human error, and saving time
- Designed (SolidWorks) and manufactured (CNC) a jig to simultaneously hold and mask 300 hex nuts for sandblasting, so only the inner threads would be blasted, significantly reducing time and cost for the company
- Programed a laser engraver to remove black anodize from 9 very small and detailed faces of electronic casings, reducing masking time and cost. Designed and manufactured (CNC) a jig to allow for rapid and reliable laser removal of these parts
- Analyzed surface roughness (profilometer), shank diameter (micrometer), and visual quality of various bolts for a key client

PROJECTS

5 Axis Nonplanar 3D Printer, Senior Design Project – Gonzaga University, Spokane WA August 2020 to May 2021

- Built a true nonplanar FDM 3D printer with five degrees of freedom
- Improved existing slicer software for nonplanar printing and develop custom G-Code for test prints
- Organized and oversaw weekly meetings to ensure all team members are involved and have personal weekly deliverables

Ski Dynamics Monitoring System – Gonzaga University, Spokane WA January 2021 to May 2021

• Designed a 9 degree of freedom (DOF) sensor system to track translation, rotation, and magnetic field readings at 50 Hz, and broadcast it to a mobile data hub collecting GPS, altitude, and temperature data at 1 Hz
• Designed and manufactured (FDM 3D printer) custom waterproof housing units for the 9 DOF sensor
• Installed the sensor system at 6 discreet locations on a pair of skis and performed field testing and data analysis

PUBLICATIONS

• Crandall, Aaron S., Steven Mamolo, and Mathew Morgan. "SkiMon: A Wireless Body Area Network for Monitoring Ski Flex and Motion during Skiing Sports." *Sensors* 22.18 (2022): 6882.

CERTIFICATIONS

• **Engineer in Training (EIT)** May 2021
• **Certified SolidWorks Professional (CSWP)** June 2020

AFFILIATIONS AND AWARDS

• **The Order of the Engineer** April 2021
• **Tau Beta Pi** November 2020
• **Gonzaga Innovation Research Award** May 2020
• **Gonzaga Entrepreneurial Leaders Scholarship** March 2017