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Summary

Materials and Process Engineer with several years of research and technical experience in space hardware with a wide range of knowledge in advanced materials characterization techniques specializing in polymers, adhesives, coatings, non-metals, and surface properties. An advocate for creativity, adaptability, innovation, problem-solving, and teamwork.

Education

D.Eng. Engineering Management
The George Washington University | Washington DC (remote)
Expected: Dec 2024

M.S. Materials Science and Engineering
with Advanced Materials Characterization certificate
University of Kentucky | Lexington, KY

B.S. Materials Science and Engineering
with Nanotechnology emphasis and Physics minor
University of California, Merced | Merced, CA

Relevant Certification

Leadership and Management Graduate Certificate
Harvard University Business School | Cambridge, MA

Relevant Experience

Space Tango | Lexington, KY | May 2021 – Feb 2023

Lead Materials and Process Engineer | *Jan 2022 - Feb 2023*

- Leads materials research and development (R&D), materials design, and technology development to implement engineering concepts and materials requirements into Cubelab ™ products, hosting biological experiments in the International Space Station (ISS).
- Leads the development of materials technical proposals, standard operating procedures (SOP), and test plans for iterative materials technology development.
- Communicate with cross-functional teams, stakeholders, vendors, and suppliers to facilitate parts production and integration of subassemblies, assemblies, subsystems, and systems.
- Reviews CAD models and drawings to ensure the required materials requirements and specifications are met and implemented.
- Supervises the testing of metals, polymers, ceramics, adhesives, material coatings, surface finishes, and materials adhesion.

Lead Materials Engineer (Internship) | *May 2021 – Dec 2021*

- Led materials research and development (R&D), materials design, and technology development to implement engineering concepts into Cubelab ™ products, hosting biological experiments in the ISS.
- Led the development of materials technical proposals, standard operating procedures (SOP), and test plans for iterative materials technology development and mechanical testing.
- Supervised research and testing of metals, polymers, ceramics, adhesives, material coatings, surface finishes, and materials adhesion.

University of Kentucky | Lexington, KY | Jul 2019 – Aug 2022

Lead Researcher, Materials Science and Engineering

Awarded – NASA EPSCoR Graduate Fellowship
Awarded – Excellence in Materials Engineering and Department of Education Fellowship

- Directed materials testing and surface characterization of low surface energy polymers and elastomers for use in microgravity experiments.
- Led the development of materials technical proposals, standard operating procedures (SOP), and test plans for materials research and development.
- Implemented materials solutions to support the materials technology development and manufacturing of components into the Cubelab ™ products, hosting biological experiments in the ISS.
- Led materials characterization of polymers and elastomers through microindentation and FTIR to study mechanical behavior and validate the structural integrity of materials.

Rio Blanco Development | Terra Bella, CA | Jan 2018 – May 2018
Materials Engineer (Internship)

- Performed testing on environmentally friendly concrete samples and non-metallic materials for phase and chemistry identification using XRD and EDX/EDS to validate materials' composition and structural integrity.
- Analyzed structure and particle size distribution of non-metallic samples using the stereomicroscope, Köhler illumination in the optical microscope, and SEM imaging.

NASA Jet Propulsion Laboratory | Pasadena, CA | Jun 2016 – Dec 2016
Materials Engineer (Internship in Micro/Nanodevices)

- Worked on carbon nanotubes (CNT) composites fabrication for the Mars Exploration Program and Super-lightweight Aerospace Composites project.
- Fabricated CNT composites using potassium hydroxide (KOH) etching, Nickel-Copper electroplating, Cyclic Voltammetry, and Chemical Vapor Deposition.
- Executed electro-polymerization and hydrothermal growth experiments on zinc nanowires.
- Fabricated carbon micro-electromechanical system (MEMS) through SU-8 photolithography.

Other Experience

Unmanned Aerial Systems at UC Merced | Merced, CA | Aug 2018 – May 2019
Drone Flight Systems Manager
First-Place Winner –Innovate to Grow Engineering Design Competition

- Led materials research and development (R&D), mechanical design, and technology development to implement engineering concepts into drone products.
- Supervised safety and training documentation, specifications, and plans to ensure product standards were met.
- Designed a drone that live-streamed a UC Merced campus tour to showcase campus points of interest for prospective and remote students using the Mission Planner Simulation program.
- Designed a drone to scan Pierce's Disease in grapevines using image-stitching and spectral analysis to help Sonoma grape growers detect early on-stage diseased plants before the disease spreads to other vines.
- Obtained an Unmanned Aircraft Systems license through Federal Aviation Administration (Certificate Number: 4185829).

University of California, Merced | Merced, CA | Feb 2017 – May 2019
Lead Researcher, Materials Science and Engineering
Awarded –Outstanding Undergraduate Student in Materials Science and Engineering
Awarded –Undergraduate Research Excellence

- Characterized a biopolymer, Resilin, using Optical Microscopy and Dynamic Mechanical Analysis/Spectroscopy (DMA) to study mechanical response and behavior.
- Redefined Considere's Construction theory by assessing the intent and usefulness of Considere's method using computational models to predict the mechanical behavior of materials.
- Executed mathematical modeling on mechanical properties of polymers and elastomers using MATLAB and Simulink to predict materials' behavior.

Software & Web Tools

Advanced Proficiency–M.S. Office, MATLAB, Simulink, WebPlotDigitizer, Kaleida Graph.
Basic Proficiency–Autodesk 360, SOLIDWORKS, ANSYS Granta, Jira, Confluence, Atlassian.
Eager to learn new software applications based on need.

Equipment

Advanced Proficiency–Optical Microscopy, Stereomicroscopy, Scanning Electron Microscopy (SEM), X-ray Powder Diffraction (XRD), Energy Dispersive X-ray Spectroscopy (EDX/EDS), Microindentation, Fourier-transform infrared (FTIR) spectroscopy.
Basic Proficiency–Transmission Electron Microscopy (TEM), Dynamic Mechanical Analysis/Spectroscopy (DMA), Chemical Vapor Deposition, Electroplating, Cyclic Voltammetry, Photolithography, Formlabs 3D printer, Laser cutting equipment. *Eager to learn new equipment based on need.*

Programming

Basic Proficiency– Java, Python, C++. *Eager to learn new programming languages based on need.*