Abbas Mirza

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Education

GPA: 3.5

Drexel University - M.S. Biomedical Engineering & Bioinformatics *2023 - 2025*

Coursework: Medical Device Development, Additive Manufacturing, Imaging Systems, and Tissue Engineering

Drexel University - B.S. Mechanical Engineering *2018 – 2023*

Concentration: Design & Manufacturing Systems

Engineering Experience

Graduate Research: 3D-Printed PEKK Vertebral Implant Development *Dec 2024 – Present*

Drexel Implant Research Center

- Spearheading interdisciplinary R&D initiative developing next-generation, patient-specific spinal implants with Poly-Ether-Ketone-Ketone (PEKK), redefining standards in personalized orthopedic medicine.
- Orchestrating a full translational design pipeline from CT-based segmentation to finite-element-validated prototype fabrication using advanced additive manufacturing technologies.
- Driving clinical co-development with Jefferson University Hospital spine surgeons to ensure regulatory alignment (ASTM F2077, ISO 10993) and clinical translation feasibility.
- Supporting material innovation by optimizing porosity and lattice topologies for osteointegration and load distribution under physiological stress regimes.

Robotic Manufacturing Automation Cell – B&G Manufacturing *Oct 2022 – Jun 2023*

- Directed a multidisciplinary engineering team in designing and implementing a fully automated robotic end-effector system, achieving a 90% reduction in manual handling and an annualized savings exceeding $100K.
- Executed complete product life-cycle development: concept, CAD/FEA validation, prototyping, and production integration.
- Engineered high-precision end-effector geometries with parametric modeling and iterative FEA/FMEA cycles in SOLIDWORKS + ANSYS.
- Authored comprehensive technical documentation adopted company-wide as the reference for future robotic integration initiatives.

Optical Manufacturing Co-Op *Nov 2020 – Mar 2021*

Horiba Instruments

- Led a high-impact R&D initiative to quantify and standardize optical coating performance, enhancing measurement precision and reducing recurring test costs by $10,000+ per year.
- Collaborated with senior optical physicists to resolve alignment and chromatic dispersion challenges in OEM spectrometer assemblies, achieving sub-micron accuracy thresholds.
- Designed, fabricated, and validated optical fixtures using SOLIDWORKS and THORLABS components, integrating lean manufacturing principles to accelerate turnaround time by 25%.
- Authored process optimization documentation later incorporated into the company's global quality management system.

Engineering Analyst *Sep 2019 – Mar 2020*

Capital Project Management Inc.

- Conducted forensic delay and cost analyses on multimillion-dollar infrastructure programs (federal embassies, power facilities, and transportation systems) utilizing the Critical Path Method.
- Combined large-scale scheduling data into executive visual dashboards, guided litigation-support strategy for Fortune 500 clients.
- Partnered with senior project executives to implement predictive risk-mitigation models, improving project delivery accuracy by 15%.

Skills, Certifications, and Leadership

Technical:

Engineering: SOLIDWORKS, Creo, Auto-CAD, REVIT, 3D Printing, Fusion 360, CURA, FormLabs, Dicom to Print, Slicer 3D, Microsoft Office

Programming: Python 3, MATLAB, R, LaTeX, SQL, BASH, HTML, PHP

Soft Skills:

Teamwork, Strong Organization, Critical Thinking, Research Paper Writing, Technical Report Writing, Microsoft Suite, Endnote, Regression Analysis, Hypothesis Testing, Simulation Modeling

Leadership Experiences:

Private Engineering and Mathematics Tutor, Drexel University Concierge Lead and Trainer, FISDU Barrio Documentation and Choreography Organizer, Intramural Volleyball Captain

Certifications:

Codecademy Python 3 Certification, Coursera Google Data Analytics