Muqtadir Hussain

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Education

McMaster University September 2019 - April 2025
Bachelor of Engineering and Management (B.Eng.Mgt.), ***Engineering Physics*** *Hamilton, Ontario*

Skills

Simulation/Programming: MCNP4C, MATLAB, Python, C, C++, FlexPDE, Maple, ANSYS Fluent, Excel (VBA)

Instrumentation/Fabrication: GD&T, P&IDs, FEA, PID Control, Cleanroom Microfabrication, Geomagic, Polyworks, SolidWorks, Inventor, 3D Printing, Prototyping

Industrial: Technical Reporting, Root Cause Analysis, Project Management, Stakeholder Liason, Event Planning

Experience

Applied Precision Inc | Precision Metrology and Engineering Intern | Vaughan, ON Sept 2022 - Dec 2022

- Operated high-precision structured light and LIDAR scanners (Leica RTC 360, Zeiss Comet L3D, Faro) for reverse engineering and quality inspection across automotive, aerospace, and medical sectors.
- Processed and aligned point cloud data to generate watertight CAD models using Geomagic Design X and PolyWorks.
- Supported tooling inspections and component design workflows by preparing hybrid 3D/2D outputs for additive manufacturing and inspection reports.
- Contributed to technical research and marketing documentation while supporting logistics, sales, and documentation tasks.

Projects

SOTI Inc, Mississauga, ON – Industry Consulting Project | *Systems Engineering, NLP, Cost Analysis*

- Co-engineered an AI-driven autonomous client-engagement system to resolve lead-qualification and conversion inefficiencies for enterprise software firm SOTI, integrating business-process mapping with NLP-capable virtual agents.
- Built a data-backed cost & performance model (CAD $10 k phased budget, KPIs, risk register); compared two architecture options with a weighted-scoring matrix and selected the higher-ROI solution for pilot rollout.
- Co-authored a client deck and executive presentation detailing system architecture, decision logic, risk mitigations and projected increases in leads and conversion (30% and 15% respectively), securing stakeholder approval and an implementation timeline.

MCNP (CANDU Reactor) – Fuel–Bundle Optimization | *MCNP, Reactor Physics, Fuel-Cycle Analysis*

- Built a 37-pin MCNP model with heavy-water moderator and benchmarked natural-U ($k_{eff} \approx 1.02$), MOX (1.69), 1.6% enriched-U (1.60) and duplex ThO_2 (sub-critical, $0.90 \rightarrow 0.44$) fuel options.
- Compared flux symmetry, power peaking and prompt-neutron lifetimes (NU ≈ 80 µs $\rightarrow$ MOX ≈ 42 µs) to identify control implications and breeding potential.
- Delivered a formal presentation documenting assumptions, tally outputs and fuel-cycle economics, recommending MOX for power-uprate scenarios and outer-ring ThO_2 as a longer-term breeding candidate.

McMaster Nuclear Reactor | *Gamma Spectroscopy, Neutron Imaging, NDT*

- Performed gamma-spectroscopy, neutron attenuation and radiography experiments with HPGe, NaI(Tl) and BF_3/He-3 detectors; calculated decay constants, macroscopic cross-sections and image L/D ratios for shielding and non-destructive testing applications using ASTM E545 standards and ImageJ.
- Authored comprehensive lab reports emphasizing method traceability, uncertainty analysis and operational safety.

Extra-curricular

McMaster Engineering and Management Society | VP External Affairs September 2021 - April 2022

- Led partnerships with student clubs and external organizations; co-hosted a fintech-focused blockchain and decentralized finance workshop alongside MacFinTech.

McMaster Engineering and Management Society | Alumni Night Chair September 2020 - April 2021

- Organized and hosted the 4th Annual MEMS Alumni Night with over 150 attendees inlcluding students and alumni; coordinated planning, outreach, and logistics.

Interests

Traveling | Basketball | Scuba Diving | Finance | Trading | Fitness | Freelancing | Teaching | Cooking | Reading