Rahul Shagrithaya, M.Eng.

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WORK EXPERIENCE

Graduate Engineer Trainee – Probabilistic Risk Assessment (NS&L)   October 2024 – Present
Kinectrics   *Toronto, Ontario*

- Supporting updating the Darlington Nuclear Generating Station (DNGS) Level 1 and Level 2 At-Power and Outage Internal Events Probabilistic Safety Analysis (PSA) Report for 2025
- Analyzed reactor power, temperature, and pressure to calculate total time spent in each reactor state for all 4 DNGS units between 2019 and 2023 to evaluate average duration and probability of reactor states
- Verified system importance and uncertainty analysis for Level 1 At-Power Fuel Damage Category events
- Verified Level 1 At-Power Fault Tree database containing basic events, type codes, and common cause failures

Graduate Engineer Trainee – Mechanical & Piping Design (DE&S)   January 2024 – October 2024
Kinectrics   *Toronto, Ontario*

- Designed and replicated test equipment layout to conduct a vault depressurization test on Bruce Power Units 5, 7, and 8 to support Major Component Replacement (MCR) projects
- Supported Project 2030 for Bruce A and B reactor power uprates to 100% full power to investigate opportunities for upgrading the boiler feedwater, main condensate, and moisture separator systems
- Developed a design standard for Bruce Power for non-welded pipe fittings for non-nuclear piping designations to allow the use of cold fittings without Engineering Change Control (ECC) processes
- Provided Technical Team Lead and Project Management support for various projects to coordinate technical and management tasks

Innovation Program Management Assistant – Co-op   August 2022 – August 2023
Kinectrics   *Toronto, Ontario*

- Analyzed CNSC's nuclear licensing & regulations to summarize critical insights from CNSC meetings on CNL to assist in developing a whitepaper on 10 nuclear licenses held by CNL
- Assisted in testing, enhancing, and developing business cases for Boston Dynamics SPOT robot for remote inspection & maintenance of nuclear power plants
- Led 2 successful drone demonstrations for developing nuclear and non-nuclear inspection & maintenance business cases ensuring safety through Job Safety Analyses (JSA) and Pre-Job Briefs (PJB)
- Programmed a Visual Basic for Applications (VBA) software and dashboard to monitor 135+ New Product Development (NPD) projects' progress and revenue forecast for the next 5 years

Research and Development Intern   August 2019 – December 2019
Curiouz TechLabs, Manipal Institute of Technology   *Manipal, India*

- Partnered and collaborated with 4 doctors and a professor to design tumour-removal endoscopic scissors to improve the diagnosis of small visible tumours in bladders
- Investigated 2 existing endoscopic scissors to propose and implement an updated, improved, and safer design
- Designed and assembled more than 15 CAD models in Siemens NX and created rendered images, videos, and illustrations in KeyShot that were used for written reports, documentation, diagrams, and presentations
- Patent published, June 17, 2021, *"A scissors-needle system for intra-cavitary hydro-dissection and excision of tissues,"* WO/2021/116776

Research and Development Intern   June 2019
MLBE Laboratory, Cracow University of Technology   *Krakow, Poland*

- Assisted in the development of environmentally friendly and sustainable systems to minimize the use of renewable energy consumption
- Designed a 600 mm diameter heat exchanger in Fusion360 that could heat water using hot kitchen air by 10°C and analyzed the heat and fluid flow in Ansys Fluent

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SKILLS

Software: Bruce Power Maximo, Microsoft Access, CAFTA
CAD: Siemens NX, CATIA, Fusion 360
Programming: Python, Visual Basic for Applications (VBA)

EDUCATION

Master of Engineering (M.Eng.)   **Graduated 2023**
Manufacturing Engineering   *Hamilton, Ontario*
McMaster University
- Cumulative GPA of 11.56 on a 12.0 scale

Bachelor of Technology (B.Tech.)   **Graduated 2021**
Mechanical Engineering, Minor in Business Management   *Manipal, India*
Manipal Institute of Technology
- Cumulative GPA of 8.30 on a 10.0 scale

RELEVANT PROJECTS

Fluid Structure Performance Analysis
- Analyzed high-speed three-lobe bearings using Fluid Structure Interaction (FSI) in Ansys Workbench and Ansys Fluent considering 9 different properties to compare the structural strength of all combinations
- Simulated 24 combinations of bearings with various eccentricities and materials to evaluate 3 different physical properties of the bearing when it is subjected to high-speed rotation

Finite Element Method (FEM) Solver and Assembly Line Balancer Software
- Programmed 3 software in Python using NumPy and SQLite to automate FEM problems in beams and trusses, and solve production assembly line balancing problems for process improvements and minimize bottlenecks
- Developed high-quality graphical user interfaces (GUIs) using Dear PyGui on Windows to receive the problem data from the user and present the results in a user-friendly format like graphs and tables

Micro-Class Unmanned Aerial Vehicle (UAV)
- Collaborated with a multi-disciplinary team of 38 to research high payload carrying capacity and high strength-to-weight ratio but cost-efficient UAV designs
- Conceptualized and fabricated 9 designs and conducted 117 flying tests to develop a 550 g, 1.2 m wingspan fixed-wing unmanned aircraft that can be assembled in less than 90 s and carry 1,500 g of payload
- Maintained an accurate and up-to-date Excel sheet documentation of technical data and reports, modelled UAV designs in Fusion360, and drafted drawings of aircraft parts in AutoCAD that were sent for laser-cutting
- Finished 5th against 25 teams in the Society of Automotive Engineers (SAE) Aero Design East 2019 Collegiate Design Series hosted by Lockheed Martin in the micro-class category in Texas, USA