Kushal Jayarathna

Ottawa, Ontario
kushal.jay21@gmail.com| (613) 400 - 3270

Technical Skills

Programming: Python(Numpy, Pandas, Matplolib), C, C++, JavaScript, HTML, CSS

Design & Simulation Tools: GDSFactory, Lumerical, KiCad, Altium, Intel Quartus, MATLAB, SolidWorks

Technical: PCB design, PIC design, Optical simulation, Data analysis, FPGA, ASIC

Lab Equipment: Oscilloscope, high voltage power supply, Optical Spectrum Analyzer, Optical Power Meter, Digital Multimeter

Languages: English (Fluent), French (Fluent), Spanish (B1), German (A2)

Experience

III-V Integrated Photonics Researcher *Jun 2023 - Present*
Max-Planck Institute, Dolgaleva Group for Nonlinear and Integrated Photonics

- Electro-optical characterization of temperature-tunable Indium Phosphide DFB lasers.
- Developed automation scripts for data collection and PID control, cutting acquisition time by 80%.
- Characterization of Continuous-Variable Quantum Key Distribution transmitters and receivers.
- Characterized 30+ photonic waveguides and analyzed results using various Python libraries.
- Synthesized findings from 20+ academic papers to refine InP photonic devices and experimental setups, contributing to ongoing research publication.

Personal Projects

Integrated Optical Gyroscope | ***Python(GDS Factory), FDTD, FDE*** *Feb 2025*

- Design & simulation of an integrated optical gyroscope.
- Design of ASIC for electro-optical interfacing
- Integrated a coiled waveguide, on-chip DFB laser, quadrature detection system, and phase modulators for enhanced sensitivity. Currently experimenting with material selection

RFID-Based Access Control System | ***C++, Arduino-Nano*** *Jun 2024*

- Constructed an ESP8266(wifi connection) board-based door locking mechanism though the implementation of an MFRC522RFID reader

IOT Integrated Autonomous Lawn Care Machine | ***C++, ESP8266 microcontroller*** *Jul 2023*

- Implemented Dijkstra's algorithm for pathfinding and developed a phone app for inter-device communication.
- Integrated multiple sensors ultrasonic and infrared enabling obstacle detection and adaptive navigation.

Education

University of Ottawa *Sep 2024 – Present*
BASc in Electrical Engineering and Honours BSc Physics

Colonel By Secondary School *Sep 2020 – Jun 2024*
International Baccalaureate Program, French Immersion Program

Interests: *Football, Jujitsu, Piano*