

Pranav Rajesh Krishnan

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EDUCATION

University of British Columbia

Expected Apr 2030

BSc, Combined Honours in Physics & Computer Science

Karen McKellin International Leader of Tomorrow Award, **Full-Ride Scholarship**

UBC Faculty of Science International Student Scholarship for Academic Excellence

WORK EXPERIENCE

UBC Earthquake Engineering Research Facility

May 2026 - August 2026

ML Undergraduate Research Assistant, Work Learn International Undergraduate Research Award (WLIURA)

- Built and trained a hybrid **CNN-GNN deep-learning system in PyTorch** to separate structural vibration from rotor-induced harmonics, combine data from sensors at four tower heights, and predict natural frequencies, damping ratios, and mode shapes. **First author manuscript in preparation.**
- Developed a self-supervised training method that learned from unlabeled field data by requiring predicted vibration modes to reproduce relationships measured across sensor pairs, while using beam physics to keep results physically realistic.
- Compared CNN cleaning methods and GNN architectures through multi-seed experiments, diagnosing failures such as convergence to rotor harmonics and inactive encoder neurons; validated a corrective constraint across **5/5 training seeds**.
- Built a site-calibrated simulation and preprocessing pipeline matching observed wind and rotor-speed conditions and supported deployment and troubleshooting of the Cape Scott data-acquisition system for future research.

Space Systems Simulation Research

Aug 2025 - Present

PARSEC, Simulations & Software Lead

- Led Julia and Python simulation work for lunar water processing, magnetic radiation shielding, and electromagnetic launch systems, using GPU/HPC computing and numerical optimization.
- Developed simulation, laboratory-validation, and data-analysis tools for [PARSEC's contribution](#) to the **Canadian Space Agency's** Aqualunar Challenge, supporting CSMC's winning entry.
- Authored technical documentation for grant proposals and research handoff, creating reproducible workflows that enabled future researchers to verify and extend the models; built GLMakie and PyVista visualizations for design reviews.

SELECTED PROJECTS & ENGINEERING TEAMS

[Astral: Local-LLM-Assisted TESS Exoplanet Triage](#)

2026

- Built a research workflow to test whether small, locally run language models could screen large TESS datasets and flag promising transit signals for later review by astronomers.
- Combined Lightcurve and Box Least Squares analysis with deterministic Python validation, astronomy-database checks, traceable records, and 13 tests so every suggested candidate could be reviewed and reproduced.

UBC Orbit & UBC Rover | Engineering Design Teams

Aug 2025 - Present

- Orbit:** Developed ANSYS and Siemens Simcenter 3D thermal simulations of CubeSat components to predict temperatures during launch and orbit and support component and thermal-design decisions.
- Rover:** Developed MuJoCo reinforcement-learning environments and PyTorch control policies for a 6-DOF rover arm, with ROS2 integration for reaching and keypad-interaction tasks.

SKILLS

Languages: Python, Julia, C++, SQL

ML & Signal Processing: PyTorch, PyTorch Geometric, CNNs, GNNs, reinforcement learning, PSD/CSD analysis, Lightcurve

Scientific Computing & Simulation: NumPy, SciPy, MuJoCo, ANSYS, Simcenter 3D, GLMakie, PyVista

Systems & Research: CUDA, Slurm, Linux, Docker, Git, SQLite, experimental design, validation, technical documentation