NICK DERNOVSEK

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Summary

Engineering graduate (B.Eng.) with mechanical design, finite element analysis, and physical testing experience across climbing hardware, medical devices, and residential building assemblies. Skilled in SolidWorks, ANSYS, COMSOL, AutoCAD, and Revit, with hands-on prototyping, Instron tensile testing, and construction experience. Seeking an entry-level mechanical design or product development role.

Technical Projects

Quick-Switch Adapter (QSA) – *Fourth-Year Capstone Design Project* 2024 – 2025

- Designed an adapter that lets re-bolters replace corroded climbing bolts without swapping between tools.
- Validated the problem with the climbing community, route setters, and Petzl experts before design.
- Tested bolt strength on an Instron tensile tester, ran ANSYS FEA, and built and tested the prototype.
- Released the design files as open source for the re-bolting community.

Dynamic Load on a Climbing Carabiner – *FEA Final Project*

- Modelled a Black Diamond LiteWire carabiner (rated 24 kN) in SolidWorks for dynamic FEA in ANSYS.
- Predicted yielding at about 30 kN and confirmed the result with a mesh convergence study.

Single-Person Log Roller – *Biomechanical Design Project*

- Worked with a physiotherapist to design a patient log roller that one caregiver can operate.

Engineering Experience

Residential Construction Designer & Labourer – *Pacd Homes*, *Part-Time* Jul 2025 – Present

- Modelled 4 home types (1- and 2-storey, bungalow, basement) in SolidWorks from AutoCAD and Revit plans.
- Built code-compliant plumbing routes and HVAC/electrical fittings in SolidWorks Routing for clash checks.
- Verify designs against the Ontario Building Code and produce renders for pre-fabrication client viewings.
- Support on-site framing, foundation, drywall, and finishing work, seeing designs through to the build.

Biomedical R&D Intern – *Pocket Clinic*, *Contract Internship* Dec 2024 – Jan 2025

- Designed piezoelectric sensor components for a smart injector system in SolidWorks.
- Simulated piezoelectric behaviour in COMSOL and iterated designs based on performance analysis.

Biomedical Researcher – *KAT Innovation*, *Contract, Part-Time* Mar 2024 – Feb 2025

- Ran ex-vivo porcine bone experiments to evaluate an electrical bone-growth stimulation device.
- Modelled an equivalent circuit of human tissue resistance in LTspice and contributed to technical reports.

Education

University of Guelph Sep 2021 – May 2025

Bachelor of Engineering, Biomedical Engineering (Honours) *Guelph, ON*

- **Focus Areas:** Finite Element Analysis, Biomechanical Design, Bio-Instrumentation, Signal Analysis
- **Awards:** 1st Place, Project SOY Plus (2024); Best Pitch, IgniteLab (2024) and LaunchLab (2025)
- **Varsity Badminton:** Competed for three years alongside a full engineering course load.

Skills

CAD & Simulation: SolidWorks (3DEXPERIENCE), ANSYS, COMSOL, AutoCAD, Revit, MATLAB, LTspice
Testing & Build: Instron Tensile Testing, Prototyping, Power & Hand Tools, Framing, Concrete, Technical Drawings
Professional: Technical Report Writing, Ontario Building Code, Microsoft Office, First Aid & CPR