# PASCAL VOYER-NGUYEN

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BASc Mechanical Eng Candidate
University of Waterloo

## TECHNICAL SKILLSET

| | |
|---|---|
| CAD | Autodesk Inventor, Solidworks, Autodesk CFD, CATIA, MasterCAM, AutoCAD, Fusion 360 and Mimics |
| DESIGN | DFA, DFM, sheet metal, surface modelling, structural FEA, mechanical linkages, miniature robotics, gearboxes, robot kinematics |
| FABRICATION | Lathe, manual/CNC mill, drill press, soldering, sheet metal equipment, SLA, SLS, Polyjet and FDM 3D printing |
| PROGRAMMING | C++, MatLab, RobotC and HTML |
| OTHER | Adobe Photoshop, LaTeX, Excel and DaVinci Resolve |
| DRAFTING | GD&T, tolerance analysis, assembly drawings, PLM, PDM |
| LANGUAGES | French, English and Spanish |

## RELEVANT EXPERIENCE

### Waterloop — University of Waterloo Hyperloop Team — Sep 2017 – Present

Mechanical Lead — Aug 2020 – Jan 2021
Integration Lead & Co-op Supervisor — Jan – Sep 2019, May – Aug 2020
Structures Lead — Sep 2018 – Dec 2018

- Bridged mechanical and electrical teams facilitating integration between pod subsystems, directly managed full-time Co-op student
- Led a sub-team of 20+ through the design, prototype and fabrication of a chassis, aerobody and suspension system for a high-speed pod operating inside a vacuum tube, consistently placing among the top 50 teams in the world
- Finite element analysis driven design of structural frame; setup of nominal/crash loading conditions, resonant frequency analysis
- Produced detailed drawings for external manufacturing, component sourcing for guidance system: wheels, dampers, motors, etc.

### Neuralink — May – Aug 2021

Mechanical Engineering Intern

- Mechanical design and prototyping for novel surgical equipment, tools and processes
- Assembled, maintained and designed subsystems for high precision surgical robots
- Wrote image processing scripts to track and analyse object motion data using MatLab

### Matician Inc. — Jan – Apr 2021

Mechanical Engineering Intern

- Product design and prototyping for autonomous consumer robots using master modelling on Solidworks
- Led design development for specific failure modes of various mechanical subsystems as well as designed experiments and testing rigs to validate the effectiveness of new concepts

### Clearpath Inc. — OTTO Motors — Jun – Aug 2020

Mechanical Design Co-op

- Conceptualisation, design and release for production of a vehicle test-bench for hardware-software integration testing
- Mechanical and control system architecture design for next gen OTTO self-driving lift trucks
- Sheet-metal design of structural components for new OTTO self-driving vehicles

### SickKids The Hospital for Sick Children — CIGITI Lab — Jan – Dec 2019

Robotics and Embedded Sensor Research Assistant

- Created parametrised geometric models of fully functioning 3D printed heart valves using complex surface modelling
- Designed experiment and built test rigs to simulate blood flow and validate synthetic valve performance using MRI
- Programmed motor control, performed kinematic analysis and end-effector deflection analysis for 6 DOF robotic manipulator
- Designed a compact belt tensioning system for a surgical robot, highly specialised surgical tools such as neurosurgical instruments and an MRI-compatible patient positioning device for image-guided surgery
- Part sourcing, drafting, assembly and documentation for clinical prototypes

### Electrical Contacts Limited — May – Aug 2018

Junior Engineer

- Managed and cost-justified a project to implement EDM equipment to shorten tooling repair lead times by over 80%
- Wrote technical documentation, conducted time studies, performed data analysis and drafted part drawings for the engineering, quality and tool & die departments
- Designed a passive part flipper and feeding technique to replace manual loading and increase press rates

# PUBLICATIONS

## *OPERATIVE NEUROSURGERY*

Grace Y. Lai, Pascal Voyer-Nguyen, Thomas Looi, James M. Drake & Brian W. Hanak. Sep 2020
Manual shunt connector tool to aid in no-touch technique
https://doi.org/10.1093/ons/opaa284

## *3D PRINTING IN MEDICINE*

Brandon Peel, Pascal Voyer-Nguyen, Osami Honjo, Shi-Joon Yoo & Nabil Hussein. Jun 2020
Development of a dynamic Chest Wall and operating table simulator to enhance congenital heart surgery simulation
https://doi.org/10.1186/s41205-020-00067-4

Nabil Hussein, Pascal Voyer-Nguyen, Sharon Portnoy, Brandon Peel, Eric Schrauben, Christopher Macgowan & Shi-Joon Yoo. Feb 2020
Simulation of semilunar valve function: computer-aided design, 3D printing and flow assessment with MR
https://doi.org/10.1186/s41205-020-0057-8