PASCAL VOYER-NGUYEN

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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, robotic 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
LANGUAGES	French, English and Spanish

RELEVANT EXPERIENCE

Waterloop – University of Waterloo Hyperloop Team — Sept 2017 – Present

Integration Lead & Co-op Supervisor — Jan – Sept 2019, May 2020 - Present
Structures Lead — Sept 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.

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 modeling
- 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 compact belt tensioning system for robotic manipulator as well as 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

McMaster Designathon – CAD and Design Competition — Feb 2019

First Place Winner

- Designed, prototyped and presented a full 3D model of a dust proof omnidirectional lunar rover powertrain concept compatible with the existing Apollo mission rovers in less than 24 hours

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

Team 3990 Tech for Kids – *FIRST* Robotics Competition — Sept 2013 – May 2017

Strategy Lead and Design & Fabrication Lead — Sept 2015 – May 2016
Mechanical and Game Strategy Mentor — June 2016 – May 2017

- Prototyping, design, manufacturing and assembly of an FRC caliber robot from scratch in under 6 weeks
- Logical reasoning, working under high pressure and stress environment as robot operator for 8 competition events
- Created and taught Computer Assisted Design, machining and strategic analysis courses to 30 + high school students
- Led team to 3 regional event victories, and a semi-finalist finish at the world championship

PUBLICATIONS

3D PRINTING IN MEDICINE

Development of a dynamic Chest Wall and operating table simulator to enhance congenital heart surgery simulation — June 2020
https://doi.org/10.1186/s41205-020-00067-4

Simulation of semilunar valve function: computer-aided design, 3D printing and flow assessment with MR — Feb 2020
https://doi.org/10.1186/s41205-020-0057-8