

# NICHOLAS ONG

## Mechanical Engineering

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📍 Montreal, Quebec

## EXPERIENCE

### Turbine Rotating Systems Engineering Intern

#### Pratt and Whitney Canada

📅 June 2019-Oct 2019

📍 Longueuil, QC

- Developed a unified lifing methodology for thermo-mechanical fatigue failure of turbine blades
- Analyzed failure mechanisms of crack initiation and crack propagation in orthotropic single-crystal superalloys
- Applied finite element software ANSYS MADPL and theoretical failure mechanics to assess damage parameters and the effects of shot-peening on turbine blades

### Defense and Aerospace Product Development Engineering Intern

#### Advanced Cooling Technologies

📅 June 2018-Sep 2018

📍 Lancaster, PA

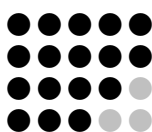
- Designed a phase-change material plate heat exchanger for cooling of directed energy weapons (DEW)
- Developed SolidWorks production drawings of custom copper-water heat pipes for clients
- Fast Fourier Transform (FFT) analysis of latent heats of fusion of n-Octadecane and n-Eicosane as phase change materials for a wax-based PCM heat sink

## ACHIEVEMENTS

- Dean's Honor List for the McGill Faculty of Engineering (2016-2020)
- Winner of the Pratt and Whitney Targeted Scholarship 2020
- McGill Engineering Competition, 2nd place: designed a transportation solution and physical model for autonomous ravine crossing (2016) and barge transportation (2017)
- McGill University CAD|Madness, 2nd place: used SolidWorks to design a capacitive, electronic ticket counter and dispenser for use at Engineering Undergraduate Society events (2017)
- Pennsylvania State Champion in technological debate (2016)

## SKILLS

Solidworks, ANSYS, Excel  
Creative Writing, Public Speaking  
MATLAB, ABAQUS,  $\LaTeX$   
Python, MasterCAM



## EDUCATION

### Bachelor of Engineering (Mechanical)

**McGill University: GPA 3.98/4.00**

📅 Est Grad. Dec 2020

📍 Montreal, QC

## WRITING

- *Jack the Jet Engine*, a children's book about the mechanisms of turbofan machinery
- *Baby's First Bessel*, a children's book about the use of Bessel functions on the playground

## PROJECTS

### Mock Nuclear Fusion Reactor Facility Design (2019-2020)

- Designed, analyzed, and manufactured an optically clear Taylor-Couette (TC) flow facility with interchangeable geometries to investigate the turbulent flow characteristics of a liquid metal vortex used to compress plasma to a fusion state
- Analyzed TC flow and cavitation using particle-image velocimetry and vortex fluid dynamics
- Provided conflict mediation for a team of 4 to effectively meet deadlines and generate design iterations

### Blood Flow Analysis in the Iliac Bifurcation (2020)

- Identified and analyzed aneurysm risk factors in the context of hemodynamic loads using pressure and wall shear stress contours
- Used CFD program ANSYS Fluent to measure and animate the velocity profiles affected by an abdominal aneurysm in the iliac bifurcation

### Literature Review on the Applications of Seismic Metamaterials (2020)

- Studied the history and modern-day use of phononic crystals in the context of seismic metamaterial cloaking
- Presented a comprehensive report on current research topics of resonant metawedges and buried seismic resonators

### Collaborative Design Project (2018)

- Designed and 3D printed a robotic manipulator with 3 degrees of freedom for a remotely-operated, Arduino- controlled rover capable of wall-climbing, battery replacement, and debris avoidance