Benjamin Tran-Pugh

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Education

University of Waterloo Sep 2025 - Jun 2030
Candidate for Bachelor of Applied Science, Mechanical Engineering *Waterloo, CA*
GPA: 3.9, AVG: 88.09%

Technical Skills

CAD Software: SolidWorks (PDM, FEA, Sheet Metal), AutoCAD, Onshape, Autodesk Inventor, Fusion360
Languages: Python (Numpy, Matplotlib), C++ (Arduino and ESP32 Programming), MATLAB, C
Other: CAE, 3D Printing, Microsoft Suite (Excel, Word), GD&T, Electrical Circuits, Machining, Technical Drawings

Experience

Mechanical Team Member Sep 2025 - Present
Waterloo Aerial Robotics Group *Waterloo, CA*

- Modelled and fabricated solutions to payload tasks on the WARG Valkyrie AEAC 2026 competition drone
- Aided in the design, fabrication, and analysis of WARG Helios to create a working fixed wing RC plane
- Collaborated with mechanical, autonomy, electrical, and software teams consisting of hundreds of members
- Utilized and significantly improved technical skills such as SolidWorks, FEA, PDM

Product Development Engineer Jan 2025 – Apr 2025
JA Canada (BEARAS JA) *Toronto, CA*

- Designed high quality bear figurines by modelling with Fusion360 CAD software to satisfy company needs
- Manufactured product safely by creating an air ventilation system to prevent potentially harmful emissions
- Optimized organic shapes for printing by testing printer settings with approximately 15 prototypes

Projects | https://sites.google.com/view/benjamin-tranpugh/home

Robotic Arm 2.0

- Used SolidWorks to model 4DOF arm components, part assemblies, and COTS to ensure smooth assembly
- Utilized SolidWorks FEA to analyze structural stability of all components to reach load requirements
- Programmed 4DOF inverse kinematics, smooth motion, and web server on an ESP32 microcontroller
- Researched robotic control systems and wrote programs in C++, Python, and MATLAB to test various constraints

Air Cannon

- Used Fusion 360 to design and test pneumatic air cannon that could launch tennis balls well over 60 meters
- Reduced cost to $100 by using spare wood and PVC piping while still maintaining high levels of safety
- Researched material properties to reduce risk of the pressure chamber exploding

High Bypass Turbofan Model

- Learned how to use SolidWorks by modelling a physical scaled down replica of a turbo fan for 3D printing
- Researched into how turbo fan engines work to create an accurate model of the Fan, LPC, HPC, HPT, and LPT
- Optimized 3D printer to create highly detailed miniature model parts while keeping parts structurally sound