

# John “Jack” Donahue

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## Professional Experience

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**Aeronautical Engineer**, Sikorsky Aircraft Corporation – Stratford, CT August 2022 – Present

- Led the development of a complete subsystem using a Model Based Systems Engineering (MBSE) approach alongside design and specification creation to meet military requirements on time at minimum weight and cost
- Performed weight trade analysis on assembly with systemwide implications using dynamics and structural analyses, communicating with suppliers, and leading multidisciplinary team discussions to achieve a 49% weight reduction
- Developed airflow schematics for multiple design configurations and analyzed performance with hand calculations and Computational Fluid Dynamics (CFD) models, then presented best solution to larger team to establish baseline
- Researched modern materials and process improvements to identify innovation opportunities for the team
- Processed the allocation of over 1400 requirements and determined verification criteria to ensure proper compliance
- Organized recurring working meetings for key tasks to maintain steady progress and stakeholder communication

**Propulsion Design Co-op**, Sikorsky Aircraft Corporation – Stratford, CT January 2021 – August 2021

- Designed drain and bleed air system routing, fittings, material choice, and clamping to meet military standards
- Created parts, assemblies, 2D drawings and Model Based Definitions using CATIA V5 to support new designs
- Analyzed several engine cycle decks in Fortran under various conditions to compare engine performance

**R&D Mechanical Engineer Co-op**, SharkNinja – Needham, MA January 2020 – June 2020

- Prototyped nozzle components using SolidWorks and rapid prototyping to improve the cleaning performance of an existing model of vacuum by 15% to address customer feedback alongside DFM and DFA criteria
  - Fabricated iterative models of impellers to optimize airflow based on CFD, pressure mapping, and air watts testing
  - Experimented with brushless DC and universal AC motors to address weight, cost, power draw, and market fit
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## Projects and Leadership

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**Mechanical Lead**, Paradigm Hyperloop/Boring September 2018 – October 2021

- Co-led the design, Finite Element Analysis (FEA), and DFMEA of an aluminum chassis to withstand a 300mph top speed and 7G deceleration with a factor of safety of 3 for the 2019 Hyperloop competition (placed 8<sup>th</sup> out of 200)
- Led the mechanical team through a design, logistics, and strategy pivot from the canceled 2020 SpaceX Hyperloop competition to the 2021 Boring Company “Not-A-Boring-Competition” (placed 6<sup>th</sup> out of 400)

**Senior Capstone**, Northeastern University June 2021 – December 2021

- Developed a low-cost, drop-in hydrokinetic water filter capable of providing a family of 4 with clean drinking water

**CEO**, Beta Gamma Epsilon Alumni Association Inc. April 2022 – Present

- Manage operations, alumni relations, and over \$2 million in assets for the STEM fraternity at Northeastern.

**Head Mechanic and Leg Leader**, 4K for Cancer November 2021 – August 2022

- Maintained 24 bikes and coordinated routes while cycling across the U.S. in 2022 to raise \$250,000 to battle cancer.
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## Skills

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**Software:** CATIA V5, SolidWorks, 3DEXperience, MATLAB, Cameo, Ansys, DOORS, Arduino, Python, C++

**Processes:** MBSE, DFMEA, FEA, Soldering, Additive Manufacturing, GD&T, Surfacing, Injection Molding

**Certifications:** Eagle Scout, Certified SolidWorks Professional (CSWP), Advanced Surfacing (CSWPA-SU), Shimano T.E.C.

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## Education

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**Northeastern University**, Boston MA May 2022

- Master of Science in Mechanical Engineering with Concentration in Mechatronics
- Bachelor of Science in Mechanical Engineering and Physics, Magna Cum Laude