

# Nicholas Mulka



Making decisions and producing results through an understanding of critical business drivers  
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## EDUCATION

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- M.S. Mechanical Engineering:** Georgia Institute of Technology **Atlanta, Georgia**  
*Concentration:* Robotics and Additive Manufacturing Design *Overall GPA:* 3.84/4.0 *December 2021*
- B.S. Mechanical Engineering:** Georgia Institute of Technology **Atlanta, Georgia**  
*Concentration:* Design *Major Specific GPA:* 3.69/4.0 *Overall GPA:* 3.43/4.0 *August 2020*
- Study Abroad: Georgia Tech Lorraine, Metz France** *January 2019 – May 2019*

## WORK EXPERIENCE

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- Engineering Design Consultant, Blue Box Air LLC:** **Atlanta, Georgia**  
*Independent Engineering Design Consultant* *December 2020 – June 2021*
- Conceptualized and designed a novel, automated belt-driven system to clean HVAC systems in SolidWorks
  - Integrated a PLC driven electronic control system with a compressor, pumps, stepper motors, and sensors
  - Designed a cost-efficient solution intended to be autonomously reliable for multiple years and cleaning cycles
- Capstone Design Graduate Teaching Assistant, Georgia Tech:** **Atlanta, Georgia**  
*Interdisciplinary and Mechanical Engineering Capstone Design* *August 2020 – Present*
- Author of 2 ASEE published papers regarding student's satisfaction for online tools I assisted in developing for team formation, project assignment, and the capstone expo used by up to 1000 students each semester
  - Guided students in engineering design principles for project prototyping, including DFM, DFA, and GD&T
- Gulfstream Aerospace:** **Savannah, Georgia**  
*Tool Design Engineer Intern, Operational Engineering Intern* *January 2018 – May 2018, May 2019 – August 2019*
- Created and presented a data-driven cost-benefit analysis to automate a portion of the aircraft skin drilling to leadership, projecting minimum savings of \$7.5 million over 15 years
  - Decreased build time of each aircraft by six hours through the creation of 3D printed manufacturing tools
  - Created new designs for a holding fixture and dolly for the aft bulkhead and baggage door with strict GD&T
  - Revised and implemented systems testing specifications and manufacturing work order operations in Solumina
  - Performed RCCA on manufacturing discrepancies and projected a timeline for operational expansions

## RESEARCH & LEADERSHIP

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- Advanced Additive Manufacturing Research:** *January 2020 – Present*  
*Lead Researcher*
- Leading a multi-disciplinary team of up to ten people to design a more capable stereolithographic (SLA) 3D printing system able to fabricate parts with minimal support structures to reduce print time and material waste
  - Identifying market needs and limitations of current printing technologies to guide project focus
  - Developed and verified simulations for curing kinetics, force dynamics, heat transfer, and fluid statics
  - Co-inventor of the patent-pending printing system and author of a SFF conference paper detailing its feasibility
- Experimental Flights Vertically Integrated Project:** *August 2019 – May 2020*  
*Sub-team Lead for Drone Delivery Station*
- Led a team of six on the development of an autonomous drone package delivery station for localized networks
  - Designed the package delivery station's internal mechanisms in SolidWorks and built a functional prototype
- Hyperloop Competition Team (HyperJackets):** *August 2018 – December 2019*  
*Sub-team Lead for Vehicle Dynamics*
- Led a team of four to create dynamic suspension simulations in MATLAB for the vehicle's suspension
  - Created CAD models of suspension components and performed FEA in ANSYS to optimize weight

## NOTABLE PROJECTS

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- Mechatronics:** Built and programmed a dual-PID controlled line-following robot in a C-programmed MSP432  
**Robotics:** Simulated the kinematics of a PUMA robot in MATLAB and Simulink using dynamic control systems  
**Optimization:** Programmed and implemented multi-objective and multi-variable algorithms for a 3D printing system  
**Design:** Redesigned a powerless leak-detection and automatic shut-off system for water heaters using DFM and DFA

## SKILLS

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- Software:** SolidWorks, CATIA V5, Siemens NX FEA, Java, Python, C programming, Autodesk Inventor, Microsoft Office and Excel, SharePoint, SAP, Solumina, Linux, ANSYS FEA, Eclipse, Arduino, AutoCAD,  
**MATLAB Toolboxes:** Global Optimization and Optimization, Control System, Signal Processing, Statistics and Machine Learning, Deep Learning, Simulink, Simscape Multibody, Curve Fitting, Image Processing  
**Hardware:** Circuitry, Lathe and Mill work, Avionics, Mechatronics, Drafting, ASME Codes and Standards, Contact Angle Goniometer, Mechanical Tester, FTIR, UV-Vis Spectrophotometer, electrical power systems, I2C, SPI, UART