

# Hans Braumann

Master of Science  
Electro-Mechanical Engineer

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## EDUCATION

August 2016-May 2021  
**Pennsylvania State University**  
Bachelor of Science:  
**Electro-Mechanical Engineering**  
Certificates: AUTOCAD Certificate

August 2021-May 2024  
**Linköping University**  
Master of Science:  
**Mechanical Engineering**  
Focus on Solid Mechanics

## SKILLS

**Mechanical Engineering:**  
FEA, Design/Structural Optimization, Vibration Analysis, Damage Mechanics and Life Analysis, Thermodynamics, Fluid Dynamics, Continuum Mechanics, Rigid Body Dynamics, Material Science, Mechanical Drives, Mathematical modelling of Mechanical Systems

**Electrical Engineering:**  
Circuit Design & Theory, Electrical drives, PLC, System Control Theory, Oscilloscope Usage, Mathematical Modelling of Electrical Systems, Digital Logic

**Modelling Software:**  
Ansys, AutoCAD, SolidWorks, Solid Edge, CREO Parametric, Multi View, Fushion360

**Misc. Computer Software:**  
MATLAB, Simulink, Ansys, ParaView, Hopson, LabView, Multisim, ControlDesk, dSPACE, Factory Talk SE, Mastercam, GIS, Code Composer Studio, Office Suite, Studio 5000

## ACADEMIC PROJECT EXPERIENCE

**Italian Institute of Technology (iIT - Center for Robotics and Intelligent Systems)**

*Optimization of triboelectric energy harvester*

January 2024 - June 2024

- Collaborative research of triboelectric energy harvester in collaboration with Italian Institute of Technology
- Conducted vibration analysis to gain better understanding of mechanical movement and electrical output relationship in regards to modal frequencies
- Redesigned artificial leaf to optimize electrical output using GA optimization
- Designed dynamic FEA code in MATLAB to be used in conjunction with optimization code
- Fabricated and tested new designs
- Sifted through experimentally obtained data

**Fluid-Structure Interaction Analysis & Optimization**

September 2023 - December 2023

- Designed and optimized hydraulic valve
- Formulated FSI problem as well as optimization problem for valve
- Achieved a maximum allowable pressure drop and deformation using the optimization
- Worked on code to perform FEA & CFD on high-performance computer
- Translated optimized design into CAD

**Autonomous Bioreactor**

August 2019 - May 2021

- Researched current methods of growing algae for optimal production
- Designed grow chamber / frame to hold bioreactor, used mathematic methods to ensure stability
- Coded PLC to keep chamber environment within optimal temperature, pH level, and light using multiple sensors and actuators
- Designed an easy-to-use touchpad interface to allow for on the fly changes to the chamber's adjustable parameters such as temperature, pH level, and light intensity
- Used simple chemistry to help aid the grow chamber in staying at optimal pH level
- Wired entire system

**Coding Languages:**

C/C++, MATLAB, G Code, Ladder Logic, Structured Text, Sequential Function Chart, Function Block Diagram, TivaWare, HTML, JavaScript, CSS

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**INDUSTRY EXPERIENCE**

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***New Product Development Engineer Intern****June 2021-August 2021**Emerson ASCO, Florham Park, NJ*

- *Designed new model of actuator to control airflow into Cummins VGT Turbo*
- *Used thermodynamics & fluid-dynamics to ensure cooling chamber worked optimally*
- *Used gear statics to design gear box to ensure effortless function*
- *Created semi-working prototype*
- *Designed experiments, then implemented them to find a way to improve manufacturing process for product*

***Electrical Engineer Intern****June 2020-August 2020**Communication Devices Inc., Boonton, NJ*

- *Designed and implemented testing device used to test newly created circuits*
- *Trouble shot and corrected malfunctioning circuits*

***Power Engineer Intern****June 2019-August 2019**American Electrical Testing Co., Boonton, NJ*

- *Redesigned switchgear circuitry to accommodate new components at power generating station*
- *Performed point-to-point checks on multiple different sub and power-generating stations*
- *Field visits to create new wiring diagram after changes were made to substations*

***Project 5000 Engineer Intern****May 2018-August 2018**Schindler Elevators, Morristown, NJ*

- *Overlooked how-to manuals and corrected them according to new information*
- *Called project site locations to ascertain progress info as well as update supervisors*
- *Created circuit schematics*
- *Created several new excel worksheets as well as worked on pre-existing ones*
- *Created presentations for monthly project update meetings*

***Valve Lab Engineer Intern****June 2017-August 2017**Emerson ASCO, Florham Park, NJ*

- *Assembled prototype valves and set up test stations – test data monitoring and gathering*
- *Tested electrical and mechanical valve components*
- *Set up customized test stations to experiment with new products*