CARSON FARMER

(540) 793-6492 | Roanoke, VA | cfarmer6@liberty.edu | **linkedin**.com/in/carson-farmer

Digital Copy
cfarm6.github.io/

EDUCATION

Ph.D. Engineering Startied August 2021
Liberty University - Lynchburg, VA
- Advisor: Dr. Hector Medina
- Topic: Chemical Optimization of Dielectric Elastomers for Sensors and Actuators via Machine Learning

B.S. Mechanical Engineering Anticipated May 2021
Liberty University - Lynchburg, VA
- GPA: **4.0/4.0**
- Minor: **Mathematics**
- Relevant Coursework: Material Science, Mechatronics, Dynamic Systems, Numerical Methods
- Leadership:
  - **President** - Engineering Missions and Research Club Aug. 2018 - Present
  - **Capstone Team Lead and Electrical Design** - Negative Pressure Exoskeleton Ventilator Aug. 2020 - Present
- Awards:
  - **Outstanding Mechanical Engineering Student** - Liberty University School of Engineering May 2021
  - **National Science Foundation - Graduate Research Fellow Program:** Honorable Mention 2021
  - **NXP Hardware Bonus Prize** - NXP Hovergames 2.0 [**Entry**] March 2021
  - **Phase I Finalist** - OpenCV AI Competition 2021 [**Link**] March 2021
  - **Best Undergraduate Creationeering Award** - Best undergraduate researcher 2020
  - **First Place - Applied Research Poster** - Research Week 2020 [**Poster**] Apr. 2020

PUBLICATIONS

- Medina, H. and **Farmer, C.W.**, 2020. Improved Model for Conical Dielectric Elastomer Actuators With Fewer Electrical Connections. *Journal of Mechanisms and Robotics*, 12(3). [**Paper**]
- **Farmer, C.W.** and Medina, H., 2020. Dimensionless Parameter-Based Numerical Model for Double Conical Dielectric Elastomer Actuators. *Engineering Research Express*. [**Paper**]
- D. Korn, **Farmer, C.W.**, H. Medina, 2021, A Detailed Solution Framework for the Out-of-Plane Displacement of Circular Dielectric Elastomer Actuators. *Engineering Reports*, [**Paper**]
- **Farmer, C.W.**, Gentry, N., and Medina, H., Remote Lab, Soft Actuators, and Machine Learning: Experimenting During a Pandemic. Poster Presented at: ASME IMECE 2020, 2020 Nov. 16-19

PROFESSIONAL EXPERIENCE

Graduate Student Lead - TRACER Lab - Lynchburg. VA May. 2021 - Present
Liberty University - Dr. Medina's TRACER Lab
- Mentored undergraduate research students in soft actuators and sensors, human computer interfaces, and unmanned aerial systems research.
- Developed BondGraphs.jl for use in multi-domain energy systems analysis via automated bond graph analysis
- Mentored a student in research on hyperelastic materials characterization and chemical modification
- Developed sensing and data acquisition system for renewable enery system being developed.
- Mentored or collaborated with a total of 15 undergraduate students since Aug. 2019.

Undergraduate Researcher - Lynchburg, VA Aug. 2018 - Present
Liberty University - Dr. Medina's TRACER Lab
- Developed a framework in Julia for comprehensive hyperelastic material modeling framework
- Provided support and teaching for ENGR 330 (Mechatronics) lab classes
- Developed drone for autonomous monitoring of crowds for transmission of Covid-19 with PyTorch
- Implemented remote lab procedures for research group in response to Covid-19 mandates
- Utilized reinforcement learning controller for nonlinear hyperelastic soft actuators
- Determined correlations between geometry and soft actuator performance in Julia
- Developed optical vibration dampening system utilizing soft actuators, sponsored by DEPS
- Developed gesture based controllers for double-conical dielectric elastomers with ESP32 and C++
- Formulated analytical method for finding performance of nonlinear soft actuators with Matlab

Entrepreneurial Engineering Intern - Remote May 2019 - Aug. 2019
The World Alliance for the Volunteer Economy: Entrepreneurial Ventures
- Worked with a mentor to develop a knowledge of electro-optical system design
- Developed strategic partnerships within the target community
- Identified and formed team for writing a Small Business Innovative Research Phase I grant

Mechanical Engineering Intern - Roanoke, VA May 2019 - Aug. 2019
Valcom
- Utilized SolidWorks for the design of injection molded and sheet metal enclosures
- Performed thermal, water, and stress tests on different product enclosure designs
- Improved cable strain-relief design on existing products with SolidWorks and experimental testing

Engineering Intern - Port-au-Prince, Haiti & Roanoke, VA June 2018 - Aug. 2018
AECOM
- Implemented performance tracking for documentation to improve productivity of Haiti office
- Conducted site inspections with other engineers to assess safety and construction concerns
- Created document templates and workflow to improve reoccurring reporting

SKILLS

Programming Languages: Julia, Python, Matlab, Simulink, PyTorch, C, C++, Mathematica, LaTeX
Software: SolidWorks, Ansys, AutoDesk Inventor, PSpice, LabView, MS Projects, Genesys