

**W. Brandon Martin, Ph.D.**  
**Augspurger Komm Engineering, Inc.**  
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## **EDUCATION**

B.S. in Electrical Engineering, Northern Arizona University, 2012

M.S. in Space Studies, University of North Dakota, 2019

Ph.D. in Systems Engineering, Arizona State University, 2021

## **EXPERIENCE**

W. Brandon Martin, Ph.D., is an Engineering Consultant with expertise in systems design and analysis, and electrical engineering. He received his Bachelor of Science in Electrical Engineering with a focus on signals and systems from Northern Arizona University and his Master of Science in Space Studies, focusing on human factors. He received his Ph.D. in Systems Engineering from Arizona State University.

Dr. Martin has been and continues to be involved in multiple cases related to Lithium-Ion batteries and safety, Battery Management Systems (BMS), solar power (Photovoltaic systems), and residential electrical systems. He has authored documents condensing US Code regarding the storage and transport safety of batteries as well as best practices for battery-involved scene investigations.

Dr. Martin has 12 years of engineering experience, including system design, testing, and analysis. For both circuit level and programming, this ranges from hobbyist electronics to space-rated systems. He also has seven years of electronics communications experience and process analysis, including cyber defense, networking protocols, and computer system troubleshooting. He is a member of the Institute of Electrical and Electronics Engineers, the American Society for Testing and Materials, and the National Association of Fire Investigators.

Dr. Martin serves as a Major in the US Air Force Reserve, consulting with the US Space Force Space Domain Awareness unit. Topics include technical capability verification, error analysis, and tactical preparedness.

## **CERTIFICATIONS**

Certified Fire and Explosion Investigator (CFEI)

FAA Private Pilot License #A5268530

ISC<sup>2</sup> Certified Information Systems Security Professional

## **EXPERIENCE HISTORY**

2021	-	Augspurger Komm Engineering, Inc., Senior Engineering Consultant
2020	- 2021	GoX Studio, Systems Engineer
2019	-	US Air Force Reserve, Space Operations Officer
2019	- 2021	Arizona State University, Graduate Research Assistant
2013	- 2019	US Air Force, Cyber Security Officer

## **ACADEMIC PROJECTS**

### Ph.D. Research

- Designed, built, and tested a wearable robotic exoskeleton providing lifting and pushing assistance to USAF Airmen
- Designed and tested a standardized testing battery for upper-body and lower-body exoskeletons
- Further work in optimization, virtual/mixed/augmented reality, and mechatronics

### M.S. Research

- Designed, built, and tested an upper body exoskeleton to work in tandem with a virtual environment
- Built custom electronics, including battery and power management for remote robotics
- Integrated real-time Mixed Reality (MR) display with spacesuit for real-time repair visual guidance for NASA SUITS competition

### Machine Learning Research

- Built/deployed image classification, text generation, and image generation routines
- Created/tested an AI-powered drone program for autonomous takeoff/landing
- Designed a defense roadmap for USAF deployed locations for AI-powered drone protection

### Fabrication

- Tested efficacy of various print orientations for 3D metal printing
- Calibrated a variety of 3D printers, laser cutters, and CNC and textile machines
- Designed/deployed multiple testing rigs for a range of evaluation requirements

## **PROFESSIONAL AFFILIATIONS**

American Society for Testing and Materials (ASTM) #2237075

Institute of Electrical and Electronics Engineers (IEEE) #98048661

National Association of Fire Investigators (NAFI) #28236

Oakland County Association of Arson and Fire Investigators (OCAAFI)

## **CONTINUING EDUCATION**

Algorithms for Battery Management Systems (in progress), University of Colorado, October 2024

Photovoltaic Cells & Systems, Certified Fire Investigator Training, November 8, 2024

Electric & Hybrid Vehicle Fires, Certified Fire Investigator Training, November 8, 2024

NFPA 70E: Electrical Safety, Small Giants, July 23-25, 2024

Fire Investigation Training, National Association of Fire Investigators, February 19-22, 2024

PV Megawatt-Scale Design, Solar Energy International, January 15, 2024

PV Installation Best Practices; Solar Energy International; May 1, 2023

Significant Changes to the 2023 National Electric Code; HalfMoon Education; April 27, 2023

Battery Hazards for the Fire Service; Oakland County; March 21, 2023

Advanced Fire Investigation Seminar; Prescott, AZ; July 27-29, 2022

OCAAFII 49th Annual Origin and Cause Seminar; Oakland County; May 2022  
Microgrid Design; Laboratory for Energy and Power Solutions (LEAPS); Aug-Oct 2020  
Deep Learning Nanodegree; Udacity, May-Sep 2018

## **PUBLICATIONS**

Claudio Vignola, Sandesh G Bhat, Kevin Hollander, Paul Kane, Emily Miller, William Brandon Martin, Alexander Y Shin, Thomas G Sugar, Kenton R Kaufman, “Design and Development of a Powered Myoelectric Elbow Orthosis for Neuromuscular Injuries”, Military Medicine, Volume 189, Issue Supplement\_3, September/October 2024

Martin, W.B. 2021. “Development of an Aerial Porter Exoskeleton and Exoskeleton Standardization Metrics.” Publication Number: 28776983. Doctoral Dissertation, Arizona State University. ProQuest Dissertations Publishing.

Martin, W.B., Boehler, A. Hollander, K. W. Kinney, D., Hitt, J. K., Kudva, J., Sugar, T. G., “Development and Testing of the Aerial Porter Exoskeleton,” Wearable Technologies, 2021  
W. Brandon Martin, Alexander Boehler, Kevin Hollander, Darren Kinney, Joseph Hitt, Jay Kudva, and Thomas Sugar. 2020. “Aerial Porter Exoskeleton (APEX) for Lifting and Pushing.” The International Symposium on Wearable Robotics. Vigo, Spain.

US patent: 63/122,022: Hip Exoskeleton Structure for Lifting and Pushing

## **INVITED TALKS**

- 2023 Martin, WB, 2023, “Development and Deployment of Exoskeletons,” Wearable Robotics Association, WearRACon 23, New Orleans, LA, March 30-31.
- 2023 Martin, WB, 2023, “PhenEx Quasi Exoskeleton Demo and Discussion,” Wearable Robotics Association, WearRACon 23, New Orleans, LA, March 30-31.
- 2022 Hollander, KW, Martin, WB, 2022, “Aerial Porter Exoskeleton (APEX) Development and Controls,” Wearable Robotics Association, WearRACon 22, Scottsdale, AZ, April 25-26.
- 2022 Hollander, KW, Martin, WB, Kinney, D, 2022, “PhenEx the Workplace Exo,” Sunrise Rotary Club, Scottsdale, AZ, October 20.

## **SKILLS**

### Programming Languages

- PLC
  - Function Block Diagram (FBD)
  - Instruction List (IL)
  - Ladder Logic Diagram (LLD)
  - Sequential Function Charts (SFC)
  - Structured Text (ST)
- C
- C#
- C++
- Java
- Java Script
- MATLAB
- Python
- RUST