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| Jonathan Harter  Jonathanjharter@gmail.com |
| Self-motivated and results-oriented individual with the goal of creating a career in energy and transportation research and development. Diverse experience as a multidisciplinary employee at Oak Ridge National Laboratory. Seeking a challenging opportunity that enables me to use my skills in electrical systems development and integration, application of industrial automation technologies, and electrical engineering. My diverse background in construction, manufacturing, and engineering has been developed through trade experience and electrical engineering education. I hold Associates Degrees in Electrical Engineering Technology and Automated Industrial Systems Technology, as well as a Bachelor of Science in Electrical Engineering from the University of Tennessee, Knoxville. Additionally, I am working towards completing a Master of Science in Electrical Engineering from the University of Tennessee, Knoxville. |

# Experience

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| NOV 2022-presenttechnical professional (grid systems hardware), ut-battelle Technical lead and Principal Investigator for multiple DOE office projects related to transportation and energy. Pioneer of automated disassembly research and development for high voltage/high energy battery systems. Investigating process development to rapidly disassemble EV battery packs beginning with diagnostics at the pack level. Pack, module, cell diagnostic and reuse/refurb/rejuvenate research for circularity and second life applications. Medium voltage extreme fast charging bi-directional power electronics converter building block design, build, and test up to 300kW. Developing high voltage power module characterization and test platform to support multiple projects and programs within DOE. |
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| dec 2021- NOV 2022Assistant Technician (Power electronics systems integration), ut-battelle Design, develop, and test power electronic systems for the conversion and transfer of power. Lead tasks related to electrical and mechanical design considering high energy density packaging. Work with research professionals to develop new advanced electronic components and systems packaging and characterization techniques. Develop new concepts and technology for electrification including EV charging, high-voltage automotive battery reuse, grid modernization, and behind the meter residential power applications. |
| july 2021-Dec 2021Laboratory technician (power electronics systems integration), Oak Ridge Associated Universities Support multiple projects within the Power Electronics Systems Integration group in electronic systems design, development, and assembly. Work with research professionals, technicians, and management to meet energy and electrification sponsor goals. Report to supervisor on lab space development in low and medium voltage hubs, and Real Time – Control Hardware In the Loop lab. Additionally, developing and planning to create a new lab space that focuses on advanced lithium-ion battery diagnostics and energy storage assembly and characterization. may 2017-July 2021Laboratory technician (Sensors and embedded systems), Oak Ridge Associated Universities Design, develop, and test novel mechatronic demanufacturing systems for the recovery of rare earth permanent magnets from electric machines and critical materials from advanced lithium- ion batteries. Maximize value recovery by implementing automation methods, machine vision, and dynamic conveying through complex process development and refinement. Report results and experiments to sponsors such as the Critical Materials Institute through oral presentation, posters, and online discussions. Work with industry, partner universities, and National Laboratory researchers to provide impactful research in rare earth critical material recovery. oct 2016-may 2017ORNL Community College Internship, oak ridge National Laboratory Work with researchers to develop experiments and systems to economically recover rare earth permanent magnets from post-consumer products such as hard disk drives. jan 2016-may 2016Production worker, atas international inc. Maintained processing equipment for the manufacturing of metal wall cladding, roof panels, and other custom metalwork. Performed quality inspections and operated heavy machinery such as roll formers and overhead cranes. aug 2013-dec 2013clinical internship, southeast oral surgery-maryville, TN Sterilize surgical tools and equipment and assist surgeons in the operating room. |

# Education

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| PresentElectrical Engineering MS, University of Tennessee KnoxvilleMay 2022Electrical Engineering BS (CUM LAUDE), University of Tennessee Knoxville |
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| may 2017 (2014-2017)Electrical Engineering Technology (Cum Laude), Pellissippi State Community COllege |
| may 2017 (2014-2017)Automated industrial systems engineering TECHNOLOGY (CUM Laude), pellissippi state community college |

# Certifications

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| may 2015Industrial automation, Pellissippi State Community COllegeDec 2015electrical systems technology, pellissippi state community collegemay 2015fanuc robotics, Pellissippi State Community COllege |

# puBlications/ Patents

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| jan 2020Electrical safety practices developed for automotive lithium ion battery dismantlement, <https://www.osti.gov/biblio/1606888-electrical-safety-practices-developed-automotive-lithium-ion-battery-dismantlement>**SEP 2023**Design of Auxiliary Power Supply for Medium Voltage Applications *Conference Paper 2023 IEEE Design Methodologies Conference (DMC) Sep 2023 Issue NA ISBN 979-8-3503-1554-7 Pages 1 – 7***OCT 2023**Zero Voltage Switching AC-DC Converter Based on Zero State Modulation (ZSM), *Conference Paper 2023 IEEE Energy Conversion Congress and Exposition (ECCE), Oct 2023 Issue NA ISBN 979-8-3503-1644-5 Pages 2245 – 2252***tbd**automated recovery of rare earth permanent magnets from electric machines conceptual design report, *IEEE/ASME Transactions on Mechatronics***TBD**hard disk drive recycling for critical material recovery, *IEEE/ASME Transactions on Mechatronics*jan 25, 2022 |
| hard disk drive dismantlement for critical material recovery, United states patent NO. 11230752 (Granted)dec 18, 2019Automated recovery of rare earth permanent magnets from electric machines, united states patent No. 11611266 (Granted) |

# Training

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| * Qualified Electrical Worker Lv. 3 (Polyphase systems < 600V AC, 1,000 V DC) * Material Handler * Direct Current Safety * Capacitor Safety * Basic Hoisting & Rigging * Lab Space Manager (ORNL) | * Battery Safety * Inductor Safety * Radiation Generating Device Custodian and Operator * Overhead Crane * Pressurized Systems * CPR First Aid/AED |

# Skills

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| * Data acquisition * Laboratory safety analysis * 2d-3d computer modeling of systems * Techno-economic analysis of systems * Design, construction, operation, and analysis of automated systems * Parts machining | * Programming C++, MATLAB, Arduino, G-Code, Vivado VHDL, TCAD Sentaurus * Robotics * Machine Vision * Public Speaking * Technical writing & reporting * Electrical wiring, signal and power |

# Research Interests

I am interested in leading R&D in electronics systems integration with a focus on developing advanced technologies to enable green energy use such as wind, solar, and other distributed energy resources. There are many technology gaps that are preventing wide-spread adoption that can be overcome by developing gap technologies. Some examples of gap technologies include smart inverters, automated power flow control, rapid electronic systems integration via standardizing connectors, high voltage electrical system packaging, and automated disassembly of EV battery packs for grid and residential energy storage applications. These technologies can reduce costs and environmental impacts related to green energy technology adoption which is critical for the future of the United States from an economic and supply chain perspective. I am also interested in developing electrical safety practices for high voltage electric vehicle platforms. As our group increases the voltage of power electronics, we must also consider electrical safety. EV platforms have reached 1500VDC and are continuing to rise as we develop faster charging systems. Salvage yards and maintenance shops will see hazardous energy levels in the next few years and there is limited research on the handling of high voltage systems. Automation can provide a safe and rapid solution to the inevitable hazards that come with advanced electric vehicles. ORNL is positioned to lead research activities related to advanced-high voltage EV batteries. These protocols and automated methods can limit the exposure of blue-collar workers to dangerous and potentially deadly voltages. Additionally, automation can reduce the number of batteries that are scrapped because they are too dangerous to work on and instead reuse them, therefore closing the loop on a circular economy.