# Arpad Attila Voros
## *Curriculum Vitae January 8th, 2022*


**CONTACT INFORMATION**

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**EDUCATION**

**North Carolina State University** — Raleigh, North Carolina
*Master of Science Electrical Engineering* — *August 2020 – December 2021*
GPA: 3.96/4.00

**North Carolina State University** — Raleigh, North Carolina
*Bachelor of Science Electrical Engineering Summa Cum Laude* — *August 2017 – May 2021*
Major GPA: 3.97/4.00 Cum. GPA: 3.76/4.00

**RESEARCH EXPERIENCE**

**North Carolina State University** — Raleigh, North Carolina
*Advisor(s)* — Dr. Tianfu (Matt) Wu — *August 2021 – December 2021*
**Independent Study — Zero-Shot Learning**
- Proposed a novel, dynamic deep-learning architecture for few-shot learning classification tasks using feature vectors.
- Analyzed and implemented ZSL dependency of said architecture with semantically meaningful latent-space autoencoder.

**North Carolina State University, U.S. Army Research Office** — Raleigh, North Carolina
*Advisor(s)* — Dr. Skip Scheifele, Dr. Rachana Gupta, Dr. Shephard Pitts, Paul Reid — *August 2020 – May 2021*
**Team Lead — Senior Capstone Project (VADER)**
- Led a team of 5 in production of a directional acoustic device for deterring African elephants from farmland.
- Designed, simulated, and prototyped multiple device solutions for the U.S. Army Research Office.
- Optimized modulation techniques in minimizing harmonic distortion, developed predistortion-distortion spectrum mapping to further improve quality of sound, simulated various directional-sound propagation techniques in MATLAB.
- Simulated analog load characteristics & hysteresis in LTSpice, designed PCBs in KiCad

**Hochschule Reutlingen** — Reutlingen, Germany
*Advisor(s)* — Dr. Bernd Thomas — *January 2020 – March 2020*
**Undergraduate Researcher — Hybrid Energy Modeling**
- Optimized Simulink and MATLAB simulations of a hybrid energy system, consisting of energy storage devices (batteries & TES) and energy transfer units (PVs & heat pumps), according to the Klucher weather model
- Ensured Simulink and MATLAB simulations were identical by finding mistakes of both models

**North Carolina State University, Duke University** — Raleigh, North Carolina
*Advisor(s)* — Dr. Robert Golub, Dr. Vince Cianciolo — *September 2017 – August 2018*
**Undergraduate Researcher — nEDM Sensing Apparatus**
- Worked on the nEDM intercollegiate experiment for the DOE. Worked at NCSU and Duke under ORNL.
- Utilized multi-axis translational stage to displace position of a wavelength shifting fiber relative to SiPM to determine precision installation requirement of "fiber-SiPM" coupling. Maximum tolerance of mounting to be used in Monte-Carlo simulation to estimate rigidity specifications of sensor containment unit used in the nEDM experiment at ORNL.

**University of North Carolina at Charlotte** — Charlotte, North Carolina
*Advisor(s)* — Dr. Joshua Tarbutton — *May 2017 – August 2017*
**Team Member — Voluntary Summer Research**
- Designed a desktop CNC milling machine for high speed machining.
- Utilized polar coordinates opposed to Cartesian in machine design. Precision rotary table was used to reduce bed size.
- Created CAD models, conducted stress tests using Autodesk Inventor, and partook in thousand-dollar decision-making.

**Intel International Science and Engineering Fair** — Waxhaw, North Carolina
*Advisor(s)* — None; but special thanks to Dr. Faramarz Farahi — *November 2016 – May 2017*
**Team Lead & Independent Researcher — Muon Scattering Tomography**
- Lead an independent research team of 3 to reduce the cost of conventional muon scattering tomography by 96%.

- Acquired provisional patent for novel approach, which utilizes volumetric scintillators and a trilateration algorithm.
- Built a semi-functional prototype. Sensing provided by SiPM arrays coupled with scintillating. Created Monte-Carlo and signal-processing simulations using Java, MATLAB, and LTSpice.
- Responsible for thousands of dollars' worth of equipment. No external funding of project was provided.

## WORK HISTORY

**North Carolina State University ECE Department** — Raleigh, North Carolina
*Advisor(s)* — Dr. Rachana Gupta, Jeremy Edmonson — *August 2021 – December 2021*
**Senior Design Lab TA — Troxler Design Center**

- Aided, informed, and serviced students with their senior capstone design project as well as related electronic equipment, component, and tools. Worked in junction with NCSU's ECE Department for lab recommendations & renovations
- Responsible for tens of thousands of dollars' worth of laboratory equipment and upkeep of NCSU Troxler Design Center

**North Carolina State University** — Raleigh, North Carolina
*Advisor(s)* — None — *September 2018 – May 2021*
**Treasurer & Committee Member — NCSU PackHacks**

- Led and helped organize the 2nd largest free hackathon in the state of North Carolina — https://ncsupackhacks.org/
- Developed budgets, acquired annual sponsorship, and managed & distributed all funds for the PackHacks event

**Duke Energy Carolinas** — Charlotte, North Carolina
*Advisor(s)* — Glen Frix, Tracy Blackmon — *May 2019 – August 2019*
**Summer Intern — Transmission Engineering**

- Created tool using VBA in MS Access which autogenerates SQL queries to find delta in external modeling data, consisting of 5 of the major neighboring energy distributors with thousands of line-connections each.
- Used said VBA tool to automate update of Duke's modeling system.
- Wrote a script in Perl which generated over 100 clean one-line displays for unmodeled 230kV-500kV lines.

**Bravo Team LLC** — Charlotte, North Carolina
*Advisor(s)* — Dr. Joshua Tarbutton — *December 2018 – January 2019*
**Winter Break Intern — Engineering Consulting**

- Worked on translating VB shot peening simulation for aerospace product manufacturer to Qt to be furthered in development on mobile platforms.
- Selected precision parts for pick-and-place SCARA robot, commissioned by same aerospace product manufacturer
- Constructed CAD models multiple variations of said SCARA robot in SolidWorks

## SUMMARY OF SKILLS

- **Computer Languages —** MATLAB, Python, C, C++, JavaScript, Java, Perl, Verilog, R, NodeJS, SQL, VBA
- **Computer Skills —** LaTeX, KiCad, LTSpice, PSpice, 2-3D CAD, Synopsis, Cadence AWR
- **Hands-On Skills —** rapid prototyping, extensive electronics laboratory experience
- **Relevant graduate courses —** ECE 763: Computer Vision, ECE 558: Digital Imaging Systems, ECE 633: Individual Topics in ECE, ECE 542: Neural Networks, ECE 513: Digital Signal Processing, ECE 514: Random Processes, ECE 560: Embedded Systems Architecture, ECE 592: Introduction to Satellites, MA 405: Linear Algebra, ECE 498: Special Projects, ECE 574: Computer and Network Security, ECE 564: ASIC & FPGA Design
- **Interests —** image processing, computer vision, signal processing, digital signal processing, deep learning, applied machine learning, information theory, data analytics & visualization, embedded systems, analog circuit design, radio, optics, acoustics, social engineering, human-computer interaction, brain-computer interface
- **Languages —** English (fluent), Hungarian (fluent), German (conversational proficiency)

## PROJECTS

For a full list with personal, academic, and professional projects with descriptions, figures, and interactivity, please see: https://arpadav.github.io/projects/

## PRESENTATIONS

- Voros, Arpad. (2021, December). *Analysis and Implementation of a Semantic Auto-Encoder for Zero-Shot Learning*. North Carolina State University. Raleigh, North Carolina
- Voros, Arpad., Cook, Hunter., Alamro, Nwaf., Fitts, Greyson. Pyrtle, Morgan. (2020, November). *Senior Design Day Team 21 – Vectorized Acoustic Deterrence of Elephants Research*. North Carolina State University. Raleigh, North Carolina
- Voros, Arpad., Daino, Trevor., Kronovet, Michael. (2017, May). *PHYS024T – Muon Scattering Tomography: Utilizing Silicon Photomultiplier Arrays to Trilaterate Muon Multiple Coulomb Scattering Events.* Intel International Science and Engineering Fair. Los Angeles, California.

## AWARDS & HONORS

*Semester Dean's List (x7)* *North Carolina State University – 2017 – 2021*

- Earning a semester GPA of 3.5 or greater on 12 – 14 credit hours of coursework, or 3.25 or greater on 16 or more credits

*1st, ECE Senior Design Day* *North Carolina State University – April 2021*

- Senior design team received first place in NCSUs ECE Senior Design Day competition for outstanding project, prototype demonstration, and presentation

*Perfect Pitch Award 1st Place Winner* *North Carolina State University – November 2020*

- Senior design team received first place of over 140 students in having the best poster and best three minute pitch in describing their project

*ASPE 32nd Conference NSF Grantee* *ASPE – September 2017*

- Received grant from National Science Foundation to cover attendance costs for the 32nd Annual ASPE (American Society for Precision Engineering) Conference at Charlotte, NC in November 2017

*Third Award, Physics and Astronomy, Intel ISEF* *Society for Science & the Public – May 2017*

- Third Award at Intel ISEF for $1,000 in the Physics and Astronomy category

*Intel Excellence in Computer Science Award* *Intel Foundation – February 2017*

- Received recognition and a prize of $200 for the original development of a Monte Carlo simulation in the Java and MATLAB languages to model the efficacy of a novel approach to conducting muon scattering tomography. The simulation modeled the propagation of muons, their angular distribution, through scintillating prisms, and through high-Z material cross-sections, real-time electronic signal read-out of SiPM, and thermal noise characteristics of SiPM

*1st, UNC Charlotte Excellence in Physics* *Physics Department at UNC Charlotte – February 2017*

- Received 1st place distinction and a prize of $100 on behalf of the demonstration of sound physics concepts in the design, construction, calibration, and simulation of a novel technique for conducting muon scattering tomography

*Region 6 NCSEF 2017 1st Place Winner, ISEF Finalist* *The Center for STEM Education – February 2017*

- Received nomination and named finalist for the Intel International Science and Engineering Fair 2017 at Los Angeles, California.

## PROFESSIONAL ASSOCIATIONS

American Society for Precision Engineering *October 2017 – October 2018*
Science National Honors Society *September 2014 – June 2017*
Mu Alpha Theta *August 2014 – June 2017*
German Honors Society *August 2013 – June 2017*

## REFERENCES

Available upon request