Joshua David Eckels

5500 Wabash Ave CM926 | Terre Haute, IN 47803 | (812) 453-1974
eckelsjd@rose-hulman.edu | https://github.com/eckelsjd/portfolio

Education:

B.S. Mechanical Engineering **GPA 3.98/4.0** 2017-2021
Rose-Hulman Institute of Technology Terre Haute, IN 47803

- Minors: Aerospace engineering, Thermal fluids, Computer Science, Music
- Coursework: Propulsion, Thermodynamics, Internal Combustion Engines, Aerodynamics Computational Fluid Dynamics, Numerical Simulation, Data Structures

Experience:

Los Alamos Dynamics | Undergraduate Researcher 2020-ongoing
Los Alamos National Laboratory, Los Alamos, NM 87545

- Performed ultrasonic wavefield imaging on components for non-destructive evaluation
- Improved performance and processing time of acoustic wavenumber spectroscopy by training a convolutional neural network to recognize defects in plate-like structures
- Integrated ANSYS, MATLAB, and deep learning workflow with Python automation

Assistive Robotics Lab | Undergraduate Researcher June-Aug 2019
Virginia Tech, Blacksburg, VA 24061

- Investigated and classified navigation constraints and barriers for autonomous vehicles
- Integrated with existing SLAM and convolutional neural networks for robotic navigation
- Utilized computer vision to identify and localize barriers in a 3D point cloud map

CS Educational Research | Undergraduate Researcher 2019-ongoing
Rose-Hulman, Terre Haute, IN 47803

- Identified misunderstandings of computer science students when reasoning about code
- Analyzed data patterns to develop an online reasoning tutor to aid in student code tracing
- Automated the collection of data from students' problem-solving approaches

Metronet Inc. | Design Intern June-Aug 2018
3701 Communications Way, Evansville, IN 47715

- Revised and performed quality control on fiber network designs and construction drawings
- Updated and maintained company as-built fiber designs utilizing GIS software
- Generated bills of materials and compiled and documented procedure manuals

AskRose Homework Help | Online Tutor 2017-ongoing
Rose-Hulman, Terre Haute, IN 47803

- Advised and strengthened students in their learning and homework
- Utilized various media resources to communicate problem-solving strategies

Various Rec Centers | Lifeguard 2016-2019
YMCA, Evansville, IN 47715

- Supervised and accounted for well-being of all patrons
- Maintained pool deck and accommodated manager's needs

Skills:

Software

- Siemens STAR-CCM+ | Experience in 2D and 3D flow visualization and CFD
- Ricardo WAVE | Experience in combustion engine analysis and simulation
- ANSYS Mech, Fluent | Proficient in ANSYS workbench tools and Python scripting
- MATLAB | Proficient in numerical analysis and system modeling
- BS SOLIDWORKS | Intermediate CAD and stress/motion analysis experience
- OpenCV, ROS, Fast.ai | Intermediate in machine learning and conv neural networks

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- Cloud computing | Remote deep learning virtual machine with GPU acceleration
- Languages | Proficient in Java, Python, C, Linux and shell scripting
- GIS | Experience with 3-GIS software
- Low-level language | MIPS, Verilog, test-benching, assembly, hardware

Practical and Lab

- Wind tunnel labs | Experience with airfoil wind tunnel testing and measurement
- Engine cycle analysis | Familiarity with turbojet engine cycle analysis and carpet plots
- Basic shop skills | Experience with mills, lathes, welding, CNC, etc. fabrication

Activities & Honors:

Activities

- Formula SAE | Aero team member, simulating new under-tray design in CFD
- Choir | President and organization lead in acapella and chamber choirs
- Tau Beta Pi | Engineering honor society and community involvement

Honors

- Barry Goldwater research scholarship nomination — 2019
- Heminway Bronze medal for top of undergraduate class — 2019
- Rose-Hulman Dean's List 9/9 quarters — 2017-present

Conferences:

International Modal Analysis Conference (IMAC) — Feb 2021
Orlando, FL 32819

- (In progress, submitted) J.D. Eckels, I.F. Fernandez, K. Ho, N. Dervillis, E.M. Jacobson, and A.J. Wachtor, "Application of a U-Net Convolutional Neural Network to Ultrasonic Wavefield Measurements for Defect Characterization," presented at the 39th Int. Modal Analysis Conf. (IMAC), Orlando, FL, USA, Feb. 8-11, 2020

Publications:

(In progress) J.D. Eckels, I.F. Fernandez, K. Ho, N. Dervillis, E.M. Jacobson, and A.J. Wachtor, "Application of a U-Net Convolutional Neural Network to Ultrasonic Wavefield Measurements for Defect Characterization"

References:

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Dr. Adam J. Wachtor
Postdoc and project mentor

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