

Joshua David Eckels

5500 Wabash Ave, Box 926 | Terre Haute, IN 47803 | (812) 453-1974 | eckelsjd@rose-hulman.edu

- Education :** **Bachelor of Science, Mechanical Engineering GPA 3.98/4.0 Aug 2017 – May 2021**
Rose-Hulman Institute of Technology, Terre Haute, IN 47803
- Minors: Computer science, Aerospace engineering
 - Courses: Thermodynamics, Fluids, Propulsion, Statics, Materials, Dynamics, Programming, Data structures, Computer architecture
 - Leadership/involvement: Grand prix engineering (GPE), Maker lab, Design Build Fly (DBF), Chorus, Chamber, Acappella (president), Tau Beta Pi
- Experience :** **REU at Virginia Tech**, Blacksburg, VA 24061 **June 2019 – Aug 2019**
Researcher – 40 hr / week
- Research Experience for Undergraduates (REU) in Automotive Engineering
 - Accessibility constraint mapping for on-road, off-road, indoor autonomous transit/delivery
 - Investigated and classified navigation constraints and barriers for autonomous vehicles
 - Utilized Robotic Operating System (ROS) and computer vision (OpenCV) software to identify and localize barriers/constraints in a 3D global mapping framework
 - Integrated with existing Simultaneous Localization and Mapping (SLAM) and convolutional neural networks (CNNs) software for robotic navigation
- Metronet Inc.**, 3701 Communications Way, Evansville, IN 47715 **June 2018 – Aug 2018**
Design Intern – 40 hr / week
- Updated and maintained company as-built fiber designs utilizing GIS software
 - Revised and performed quality control on over 100 outsourced fiber network designs
 - Generated 10 fiber network construction drawings and bills of materials for new markets
 - Compiled and documented a 50-page procedure manual
- AskRose Homework Help**, 5500 Wabash Ave, Terre Haute, IN 47803 **Aug 2017 – present**
Tutor – 4 hr / week
- Advised and strengthened students in their learning and homework
 - Utilized various media resources to communicate problem-solving strategies
- Various parks and recreational centers**, Evansville, IN 47715 **2016 – present**
Lifeguard – 30 hr / week
- Supervised and accounted for well-being of all patrons
 - Maintained pool deck and accommodated manager's needs
- Projects :** **Thermofluids – Turbojet analysis March 2019**
- Utilized Matlab to model inlet/outlet properties of turbojet/turbofan engines
 - Optimized engine design utilizing cycle analysis
- MIPS – Computer processor Feb 2019**
- Designed and implemented a 16-bit assembly language
 - Executed a relative prime algorithm in 1.8 ms.
 - Designed a processor capable of 87.6 Mhz clock speed

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- Developed extensive test benches in Verilog

Matlab – Simulink optimization

Jan 2019

- Utilized Simulink to model physical systems and analyze experimental data
- Optimized residual swing velocity of a dynamic crane-pendulum apparatus

Java – Software development

Sept 2018

- Utilized software engineering principles to design a computer application
- Implemented Java classes utilizing UML, polymorphism, interfaces, Java-swing GUI

Design – Product improvement

April 2018

- Innovated product design using CAD software and reverse engineering techniques
- Compiled and documented detail drawings and bill of material for new product

Python – Robotics

Feb 2018

- Implemented Python classes for remote robot functionality
- Leveraged Python graphics and shell scripting for robotic control and navigation

Statics – Strength analysis

Oct 2017

- Analyzed stress and strain relationships in a static crane system
- Optimized cost and weight of linkage system based on material properties

Fabrication – Design and construction

July 2017

- Utilized CAD software to design and model a chair assembly
- Demonstrated proficiency in shop environment utilizing various shop machinery

Skills :

Computer skills

- Python, Java, C, C++
- Matlab, Simulink, Maple
- Solidworks, AutoCAD, Inventor
- MIPS assembly, Verilog, Xilinx
- Geographical information systems (3-GIS)
- Linux, Ubuntu, Windows, Shell scripting and automation, Git
- Computer vision (OpenCV), Convolutional neural networks (Keras, TensorFlow)
- Robotic Operating System (ROS), Simultaneous Localization and Mapping (SLAM)

Other skills/interests

- Gas metal arc welding (GMARC)
- Shop equipment (mills, lathes, saws, CNC, etc.)
- Computational fluid dynamics (CFD), Finite element analysis (FEA)

Activities:

Extracurricular

- President – Acappella club
- Director – Chamber choir
- Secretary – Chorus
- Pianist – Pit orchestra
- Member – Grand prix engineering (GPE) team
- Member – Maker lab
- Member – Design build fly (DBF) team

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Honors

- Tau Beta Pi engineering honor society
- Rose-Hulman Dean's list

References : **Dr. James Mayhew**

Professor of Mechanical Engineering
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