Nathan Rose

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Education

Embry-Riddle Aeronautical University — MS in Computer and Electrical Engineering **GPA: 3.75**
Graduation: Spring 2022 Dean's list: Fall 2020, Spring 2021
Relevant Classes: Software Architecture, Requirements Engineering, Fundamentals of Systems Engineering, Engineering Project Management, System Safety and Certification, Random Signals, Linear Systems

Embry-Riddle Aeronautical University — BS in Computer Engineering **GPA: 3.663**
Graduation: Fall 2021 Dean's list: Fall 2018, Spring 2019, Fall 2020, Spring 2021— Honor Roll: Fall 2019
Relevant Classes: Digital Circuit Design, Microprocessor Systems, Intro to Discrete Structures, Computer Science II(OOP), Computing Aerospace and Aviation, Digital Systems Design(FPGA), Telecommunication Systems, Computer Architecture, Linear Circuit Analysis, Software Engineering Practices, Operating Systems, Real Time Operating Systems, Signals and Systems, Real Time Systems

Work Experience

Katalyst Space Technologies **June 2021 - Present**
Space Systems Engineering Intern
Katalyst Space Technologies is a startup that is focused on developing technologies for modular spacecraft

- Instructed the team on Software and Devops practices such as git and automated testing to improve team productivity
- Set up Test Driven Development and Continuous Integration practices on Azure Devops to improve software quality
- Designed a Testing Framework for a STTR Phase II project that was reviewed by an industry expert in project testing
- Designed a communication framework to allow general purpose communication between modules on a spacecraft
- Architected and programmed a program to characterize the Space Domain Awareness capabilities of multiple platforms
- Assisted in writing the Volume II and Volume V sections for a STTR Phase II Proposal
- Created a Project Plan for the Phase II STTR and managed the critical path to be within the project's deadline

Collins Aerospace **June 2020 - August 2020**
Software Engineering Intern
Designed, created, and tested software for a few different projects under Collins Aerospace

- Added functionality to the "Black Side Test Manager" that allowed for a software image to be uploaded to a remotely connected device via TFTP in Java and made a UI for said tool that would be used in the field
- Increased the efficiency of engineers in one of the labs by creating a python script that controlled a smart USB hub
- Created software that is able to listen into TENA messages in Python and print their output into individual windows for debugging

Sparton Electronics **March 2019 - August 2019**
Software Engineering Intern
The goal of the sono-buey debug controller I was working on was to improve and modernize military sono-beuys

- Programmed a Atmel microcontroller that was used as a debugging utility for integration tests of the product
- Analyzed and benchmarked a NXP processor to ensure that it would be appropriate for a defence project

Projects

Nova Flight Computer(ERFSEDS) **January 2020 — Present**
Chief Computer Engineer, Software Lead, Github Maintainer
The goal of this project is to create a flight computer from components to be used on High Power Model Rockets

- Designed a layered software architecture that was able to deal with the requirements from different stakeholders
- Created various electrical modules for the flight computer using KiCAD such as the Pyro Channels and IMU
- Lead the software team and established a software framework and practices that would be followed while programming
- Programmed the Sensor Fusion Flight Logic and Logging software modules in order to meet the project's objectives
- Set up automated testing with cmake that performs unit and integration tests and ensured developers followed TDD

Rosecore(Personal Project) **August 2020 — Present**
Creater, Quality Assurance, Developer, Ops
An ongoing project where I make a personal management software while learning new technologies such as docker and CI/CD
- Created a basic web server that can manage projects on two backend services for me in Django
- Designed service classes to allow clean decoupling between view and model and allow for changes to interfaces
- Dockerized the Django app for a standard development test and production environement
- Introduced continuous Integration with Django tests

NASA Robotic Mining Competition(Robotics Association) **September 2018 — May 2020**
Project Lead, Electrical Member, Software Member
NASA Robotic Mining Competition(RMC) is a competition held every May at Kennedy Space Center where a robot must be designed that must cross rough terrain, mine icy regolith, and return it to a bin for processing
- Integrated Mechanical Electrical and Software efforts during a system redesign to increase the performance of the robot
- Designed electrical boards in Autodesk Eagle for a microcontroller interface between the sensors and the main computer
- Managed a team of 30 members split into 4 subteams to handle different disciplines of robotics and the competition
- Programmed the walking motion of a robot with C-shaped Legs in Labview

SDA Tool(Katalyst Space Technologies) **July 2021 — Present**
Architect, Software Engineer
The SDA tool allowed developers to characterize differnt Space Domain Awareness platforms under various conditions
- Architected the structure of the code with stakeholders to determine immediate goals and path forward of the project
- Setup a automated test suite and ensured Test Driven Development Practices were followed through Code Reviews
- Set up a Continuous Integration testing pipeline on Azure Devops to automate regression testing
- Programmed several high-quality software modules outlined in the class diagram in python3
- Setup and managed the Code Repository setting up permissions and automatic code reviews

Fedora(Grad Project) **August 2020 — Present**
Creater, Quality Assurance, Developer
A project that utilized DDS and DDS-XRCE to allow communication between modular components of a satelite in a very resource constrained environment in a way that scales efficently
- Defined the planned behaviour of the software in different situations
- Removed single points of failure by planning a method to create new DDS-XRCE agents when one fails

Rose Processor(Class Project) **September 2018 — December 2018**
Designer
Modified the design of a micro-processor implemented on an FPGA in Verilog
- Increased the throughput of the processor by a factor of two by creating a three stage pipeline
- Simplified the processor's IO operations by mapping IO operations to addresses in the data memory
- Designed and implemented a increase the capabilities of the processor including implimentation of functions
- Created a variable length opcode with fixed instruction size to expand the number of operations that can be performed

Artemis Rocket(ERFSEDS) **January 2019 — May 2021**
Avionics Member
Artemis is a two-stage rocket that competes in the Spaceport America Rocket Competition.
- Discovered a safety issue that caused the flight computer to never disarm and created a fix to solve the issue
- Redesigned the Ebay in order to ensure the safety of the rocket and compliance with Spaceport America Rules
- Analyzed flight computer data to diagnose inflight issues and determine the performance of the onboard electroncis

EasyNN(Senior Design) **January 2021 — May 2021**
Developer
The goal is to create an easy to use and highly customizable software to allow people to create and train neural networks
- Created a Neural Network layer in python that leveraged Numpy in order to simplify and speed up calculations
- Designed and implimented test software to confirm the mathematics was properly implimented

ERFSEDS(Club) **May 2020 — Present**
Chief Computer Engineer
Responsible for the safe and successful operation of all electronics
- Ensured the safe design and operation of all electronics by setting up review processes for all components
- Created and Managed the organization's Github in order to provide version control and issue tracking
- Organized a Systems Engineering process for the development of electronics within Cerberus

Robotics Association of Embry-Riddle(Club) **September 2018 — May 2021**
President, Vice President
Lead the club through the COVID crises ensuring the continued success of the club

- Ensured the training of new members with workshops to teach application of engineering and technical skills
- Adapted to circumstances through the early parts of the COVID Pandemic ensuring continued development while ensuring adhering to school policies
- Increased the awareness of the projects of RAER within school resulting in the best recruiting in several years

Skills

Application: CMake, Git, KiCAD, DDS, DDS-XRCE, Docker, Docker-Compose, Eclipse, IntelliJ, Django, Autodesk Eagle, ROS, Ruby on Rails
Languanges: Python, C/C++, Java, Verilog, LaTeX, Ruby,
Other Notes: FPGA, Eagle Scout, FIRST Alumni