

## Joel Samuel Rhine

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### Education:

- **George Washington University**, Washington, DC. May, 2019. (**GPA 3.52**) M.S. in Mechanical and Aerospace Engineering
  - On-Campus Job: Graduate Student AV Assistant, GW Law Media Center
- **Don Bosco Institute of Technology, Mumbai University**, Mumbai, India. April, 2016. B.S. in Mechanical Engineering.

### Technical and Language Skills:

- **Tools:** Solidworks, Ansys, Makerbot 3D, Prusa **Spatial Analysis Tools:** QGIS, Mapbox, Google Earth Engine
- **Programming:** Python (PyQGIS, PyQt5, SentinelSat, OSMNX) **IDE:** VS Code, Atom, Jupyter Notebooks **Envs:** Conda
- **Skills:** Analytical, Collaborative, Problem-Solving, Effective Communicator, Organized, Prioritization, Risk Management
- **Languages:** English (fluent), Hindi (fluent) **License:** Part 107 Remote Pilot (Drone Pilot)

### Work Experience:

#### Development Monitors LLC, Arlington, VA

##### *Project Manager – GIS and Remote Sensing Software Development*

*May 2021 – Present*

*Technical proposal writing, schedule deliverables with measurable KPIs, develop GIS analysis software and train machine learning models*

- ARTMS 2D – Led a 5-developer team throughout project life-cycle utilizing **PyQGIS (python)**, **PostgreSQL**, **kobotoolbox/kpi**, **WNTR (EPANET)**. Incorporated agile deliverables and defined KPIs at each stage of the project, meeting **100% of defined objectives**
- ARTMS 3D – Automated 3D terrain modelling using Sentinel 2 imagery (**SentinelSat**), USGS DEM (**OpenTopography**) and OSM data (**OSMNx**) reducing manual 3D generation time from 30 mins (proficient) to under 2 (non-expert) – **93% faster**
- ARTMS AI – Achieved above 80% IoU for Afghanistan buildings using 4cm HR aerial test and train imagery. Reduced manual creation time of building footprints in 1 Km<sup>2</sup> from 20 mins (proficient) to under 1 min (non-expert) – **76% effective decrease in time and effort**

##### *Project Manager – Remote Sensing UAV Development*

*Jun 2019 – April 2021*

*Supervise and built drones and correction systems in collaboration with Virginia Tech's Unmanned Systems Lab (USL)*

- Created computer aided design (CAD) models of UAV (drone) chassis in **SolidWorks** and 3D printed using **Prusa 3D** printer
- Researched and built drone equipped with Pixhawk flight controller, planned missions in **Mission Planner** and **Piloted Drones**
- Researched and built RTK GPS components (**Ardusimple u-blox GPS, antenna, base station, and datalogger**) and equipped drone with RTK
- Generated 2D georeferenced images and 3D dem models using Open Drone Map (**ODM**) CLI

### Other Relevant Work Experience

#### George Washington University, Washington DC

##### *Junior Thermals and Design Engineer, GW-CubeSat*

*Aug 2018 – May 2019*

*Cube satellite part of **NASA's Cube Sat Launch Initiative (CSLI)** developed in collaboration with MIT and TEC University of Costa Rica*

- Created **SolidWorks** CAD models for the GW-CubeSat including the on-board camera, battery pack and the cube satellite chassis
- Identified components exceeding thermal limits around the battery pack and plasma thrusters using Ansys
- Developed 3D printed prototype of the complete CubeSat and assembled using **Makerbot 3D** printer

#### University of Mumbai, Mumbai, India

##### *Team Leader, Hoverbolt 1.0 (Hovercraft)*

*Jun 2015 – Apr 2016*

*Self-funded project of ten senior-year mechanical engineers to design, analyze, procure, build and test a pilot driven hovercraft*

- Calculated engine lift and thrust power requirements using Bernoulli's equation. **Negotiated and procured** engines and propellers
- Designed and conducted thermal and structural analysis in **Solidworks** of the hovercraft chassis, engine mounts, propeller mounts and steering column. **Machined** propeller shafts on-site using the **Lathe** and **Milling** machines
- Built a test-rig to calculate pressure distribution under the skirt and optimized for uniform cushion pressure

##### *GIS and Remote Sensing Specialist – International Development (Contract)*

*July 2019 – Apr 2023*

- CBDRM/EW – The World Bank, Afghanistan (spatial analysis of communities at risk of natural hazard) Jul 2019 – Dec 2020
- EIDA II – German Bank of Reconstruction (KfW), Afghanistan Apr 2020 – Aug 2021
- GPRBA SWM, Aden Climate Resilience, QIIP 7-City – The World Bank, Yemen Feb 2022 – Apr 2023

### Extra-Curricular Activities:

- Volo and DC Fray Social Soccer Leagues, Washington, DC, USA. – 1x Champions, 5x Runners-up Sep 2017 – Present