

# R2017755 - Senior Software Engineer, Moon Rover Planning and Scheduling

Software Engineer IV

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NASA is returning to the Moon. The VIPER lunar rover mission (<https://www.nasa.gov/feature/new-viper-lunar-rover-to-map-water-ice-on-the-moon>) will land a rover at the South Pole of the Moon to map the distribution of water ice in preparation for the first woman and the next man to land on the Moon as part of the Artemis program. VIPER is a challenging mission. Where the rover will land, the terrain is very hilly with craters of all sizes and in all directions. The sun will be just above the horizon, and the hilly terrain will cast long shadows that move slowly as the sun circles the horizon once per month. The rover requires sunlight for power and mission planners on the ground will need to account for the moving shadows as we design the path the rover will take. The Earth will also be near the horizon, and as we plan this path, we must also ensure the radio link for commands and data won't be blocked.

We seek an experienced programmer to join our team to enhance the mission planning and scheduling software by developing and maintaining graphical components that will be used to design the rover's traversal path and to schedule science and engineering activities. You will be working with a multidisciplinary team of software developers, user interface designers and spacecraft design and operations teams. If you love space, that's even better. This role is based at Ames Research Center but may require occasional travel to support users at other NASA centers around the United States.

## Responsibilities

- . Develop portions of a thick client windows desktop application that supports:
  - 2D rendering of multiple map layers indicating features of the lunar terrain (lighting, temperature, slope and other obstacles ...)
  - 3D rendering of the same map layers on top of terrain
  - Vector representations of the rover's path
  - 2D rendering of Gantt chart-based timelines
- . Apply mathematical methods and algorithms within the tool to integrate timeseries analysis and resource modelling.
- . Evaluate and mitigate development risks and trade-offs
- . Collaborate with VIPER Ground Data System personnel to integrate the planning and scheduling software.

## Required Skills & Traits:

- . A degree in computer science / computer engineering / engineering / related discipline.
- . 6+ years: .NET desktop applications with experience in C# or F# language
- . 2+ years: OpenGL, DirectX, WebGL or equivalent experience

- . Demonstrated software skills developing shippable/consumer oriented vs prototyped / research oriented software. Should be able to show prior work or side projects
- . Proven experience designing and developing testable software, unit and integration test harnesses, and test strategies
- . Demonstrate problem-solving and technical innovation
- . Demonstrated skills in:
  - . .NET desktop multi-threaded application development using Visual Studio
  - . C# or F# programming language
  - . Rendering 2D/3D graphics with APIs (OpenGL, DirectX or equivalent)
  - . Using HLSL/GLSL shaders or other vendor specific shader language.
  - . Algorithm development
  - . Effective analytical communication.
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- . Other Desired Skills:
  - . Experience with Geographic Information Systems (GIS) end-user systems or components (ArcMap, QGIS, OpenLayers, CesiumJS)
  - . Experience with frontend and backend webapp development using React, Electron, Node or similar frameworks
  - . Sensitivity to and familiarity with good user experience design techniques
  - . Experience in robotics software
  - . Strong personal interest in space missions
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