Optional Homework 7: Terrain Relative Navigation (TRN)   **Due: 04/24/24**
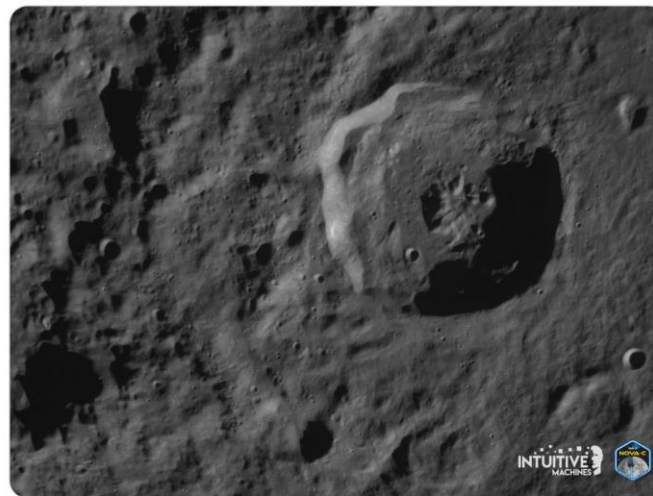
Intuitive Machines, the company that sent the IM-1 (Odysseus) Lander to the lunar surface in February 2024 posted this tweet before landing:
https://twitter.com/Int_Machines/status/1760452044454842575?lang=en

This is enough information to navigate! I'd like to know the pose (position and attitude) of the IM lander navigation camera with respect to the lunar surface reference frame (MCMF) at the instant this image was taken.

Note that this is NOT a triangulation problem. You're being asked to solve for position and attitude at the same time. This is the "Perspective-n-Point problem." You'll need to do your own research on how to solve this. There are tons of useful resources on YouTube and google scholar. I'd like you to write your own PnP solver from scratch, but you are welcome to use an in-built Matlab or OpenCV function to check your work.

The horizontal field-of-view (HFOV) of the IM navigation camera is approximately 20 degrees.

There's a handy tool online to find the latitude and longitude of craters and other features on the lunar surface. https://quickmap.lroc.asu.edu/ (try the "lunar globe" setting).