

EE/CprE/SE 4920 WEEKLY REPORT #5

Oct 17rd, 2025 – Oct 30th, 2025

Group number: 15

Project title: Vision Based Camera Motion Tracking

Client &/Advisor: Eric Wittrock & Dr. Gaffar

Team Members/Role: Isaac Kenyon, Andrew Gooding, Will Ernatt

○ **Weekly Summary**

Worked on implementing multi-threading and the many problems that arose, including UI freezing, QT environment variable errors. Partially finished communication between threads to alert users of status updates as the algorithm runs. Decreased plugin size so that clients' download sizes are smaller. Improved tracking time performance, and improved UI design and cleanliness.

○ **Past week accomplishments**

- **Eric Wittrock:** Converted user's video image sequence using Blender's built-in rendering API so that it is not necessary to ship with a copy of FFmpeg. Downscaled the image sequence only when used by the tracking algorithm to improve performance. Fixed QT error by modifying environment variables when a thread starts. Fixed process freezing caused by UI blocking thread. Worked on camera orientation quaternion problem.
- **Andrew Gooding:** Started writing a script to help automate the process of the COLMAP/GLOMAP camera tracking for MAC devices.
- **Will Ernatt:** COLMAP/GLOMAP running within Blender, worked on a multithread approach. Began work on final UI design for the plugin
- **Isaac Kenyon:** Got UI elements pushed to the github. Started implementing list functionality for past computed cloud values. It will store the file available for the user to load easily, especially if working on different versions of the cloud point for slightly different videos. Implemented the tracking script inside of blender, currently the user can select a video and click play and the program will run without blocking blender!

○ **Pending issues**

- **Eric Wittrock:** The camera is not rotating with the expected magnitude, and the floor detection algorithm appears to have a bias tilt.
- **Andrew Gooding:** None this week
- **Will Ernatt:** No major issues.

- **Isaac Kenyon:** Trouble finishing up the listing system, having trouble with the blender API, but will need to kink it out.

○ Individual contributions

<u>NAME</u>	<u>Individual Contributions</u> <i>(Quick list of contributions. This should be short.)</i>	<u>Hours Past 2 Weeks</u>	<u>HOURS cumulative</u>
Eric Wittrock	Removed the need of FFMPEG, fixed freezing problems, improved performance, fixed QT error, worked on camera orientation problems.	15:45	57:45
Andrew Gooding	Downloaded photogrammetry and tested COLMAP/GLOMAP on Blender	10	51
Will Ernatt	COLMAP/GLOMAP within blender, multithread approach, UI design	12	54
Isaac Kenyon	Colmap implemented, bash script changes	14	35

○ Plans for the upcoming week

- **Eric Wittrock:** Attempt image inpainting of environment maps using an autoencoder, U-net, or other neural network-based architecture. Fix camera orientation problem.
- **Andrew Gooding:** Continue working on the Mac version of Blender and working on getting features teammates have on windows and linux on mac. As well as finishing script to help automate colmap/glomap process.
- **Will Ernatt:** New UI for prototype. Create more benchmark videos (no-parallax)
- **Isaac Kenyon:** Finish the listing feature of past computed videos. Work on adding the parameter features into the script such that the user can turn on/off. Attempt to convert parts of the script to python. Implement blender step checks to display current progress to the user.