Progress Report

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1 Specific Research Goals

- VPQEKF (IROS - Mar. 1st): Work on the paper.
- DLO Manipulation Proposal: Work on a personal statement.

2 To Do

- Fellowship - DLO:
  - Unity dataset
  - Real dataset
  - Develop a well-written personal statement. — On-going.
  - Seek other graduate fellowship opportunities. — On-going.
  - Develop multiple versions of research and personal statements for submission to different opportunities.
- PVQEKF (Paper deadline March 1st.):
  - Setup ROS environment – (1) – due 12/7
  - Restore github access
  - Replace EKF with QEKF – (2) – due 12/7
  - Feature point extraction:
  - Depth to scale
  - BigC (where we solve Q+V together) –¿ regarding depth scale issue
  - Quat: switching problem is fixed
  - 35 solutions (start here)
  - Noise issue: noise cannot be modelled
  - Chaining step: when feature points come in and out of the frame dependency configuration.

3 Progress

The following items are listed in the order of priority:

- Fellowship: No update.
- VPQEKF: This week, I worked on Circle-around-metal dataset and sent the QEKF results to Dr. Gans. He determined there is an issue with feature points extracted by Quest+Vest code [1]. Moreover, I started working on the dead reckoning project with Asif. It is similar to the existing QEKF with additional acceleration terms.
- DLO: No update. I need to make an action plan.
- NBV-Grasping Project: No update.
- PyTorch Tutorials: Transfer learning.
- Pose Estimation: I will need it for DLO segment localization.

4 Intermediate Goals - Fall 2021:

- QEKF: Finish paper.
- Active Learning.
- UR5e: Do the tutorials.

References

[1] K. Fathian, J. P. Ramirez-Paredes, E. A. Doucette, J. W. Curtis, and N. R. Gans, "Quest: A quaternion-based approach for camera motion estimation from minimal feature points," *IEEE Robotics and Automation Letters*, vol. 3, no. 2, pp. 857–864, 2018.