From Perception to Grasping: Hybrid Visual Servoing for Autonomous Capture of Non-cooperative Targets

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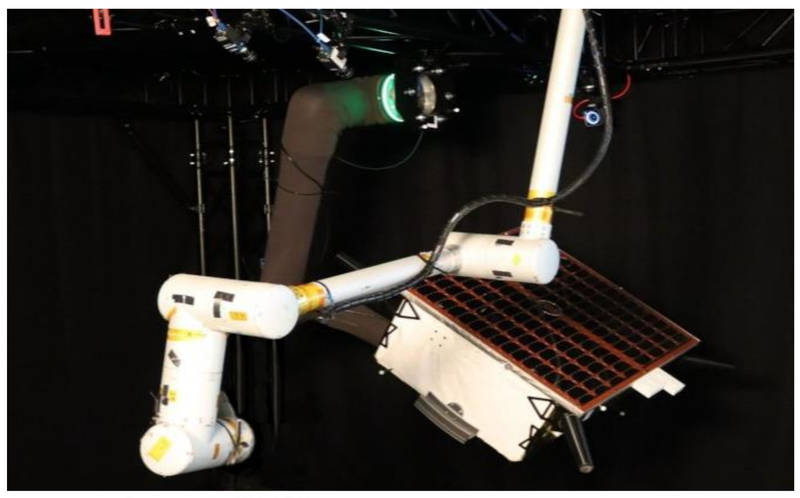
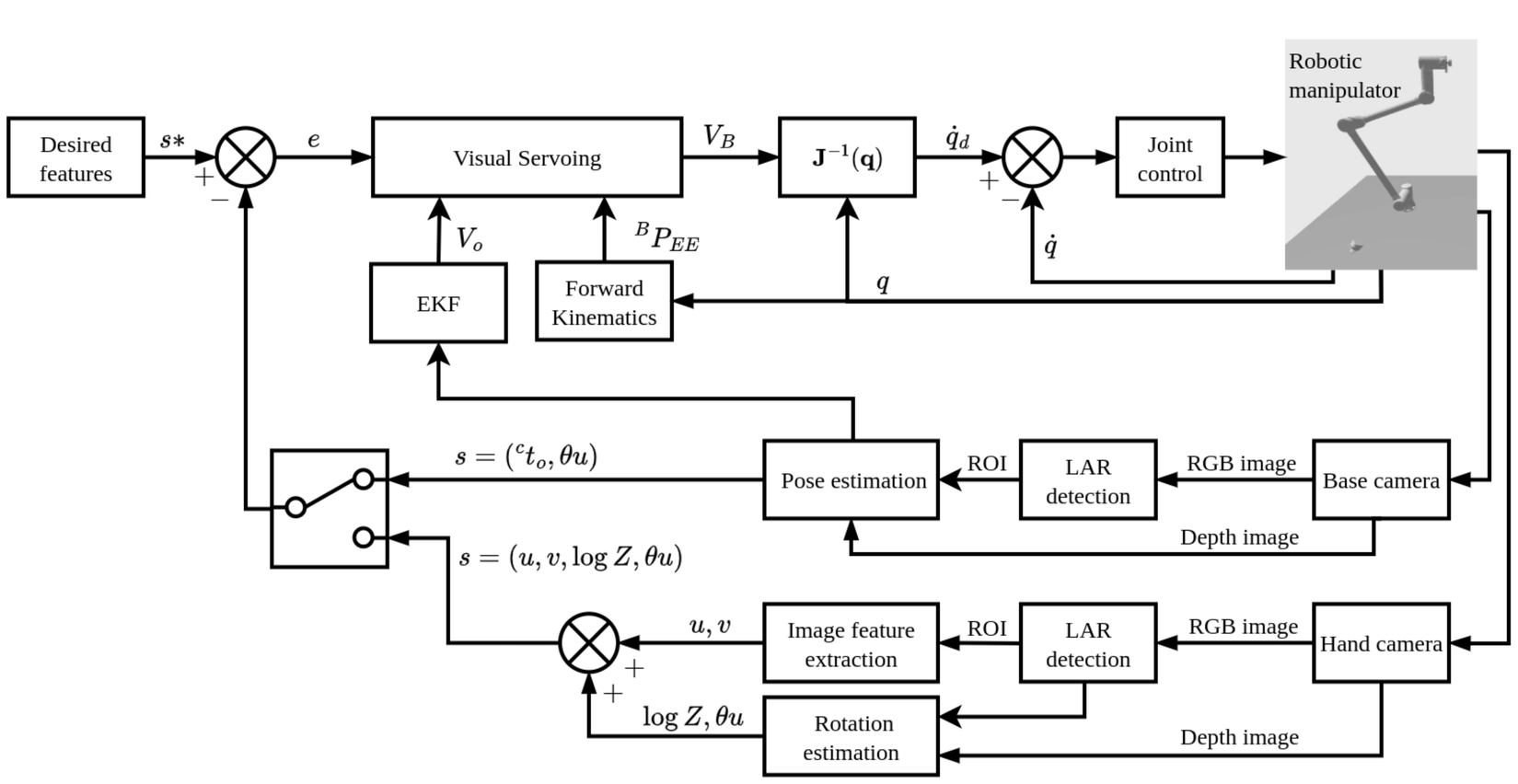
Introduction

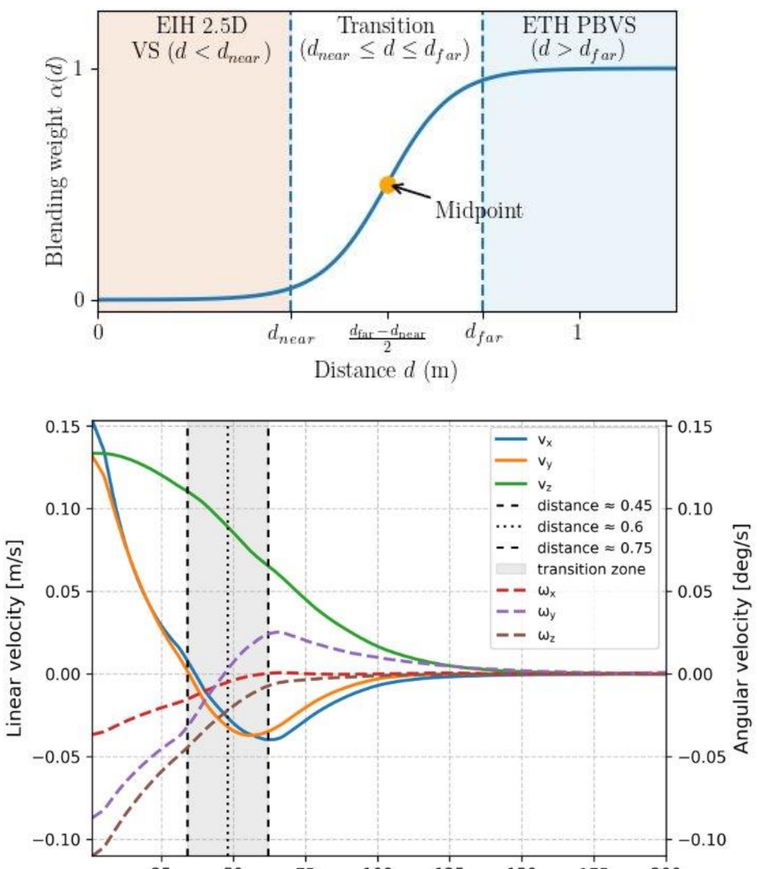
- **Visual servoing**: a core capability for **autonomous on-orbit servicing** operations.
- **Challenges:** Identification and tracking of non-cooperatives moving targets, lighting conditions, occlusions, computational and power constraints, and sim2real transfer.
- **Our approach:** multiple-camera cooperation for long- and short-range vision, pose estimation and prediction using an EKF, grasping point estimation from LAR detection, tested in space relevant scenarios.



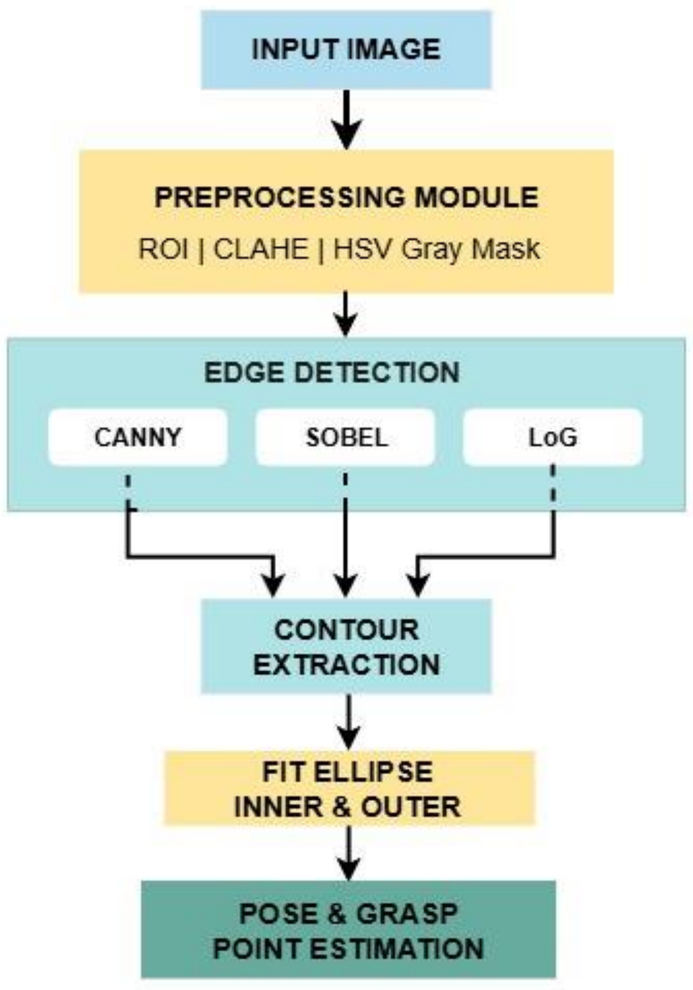
Redwire's STAARK arm approaching a satellite mockup

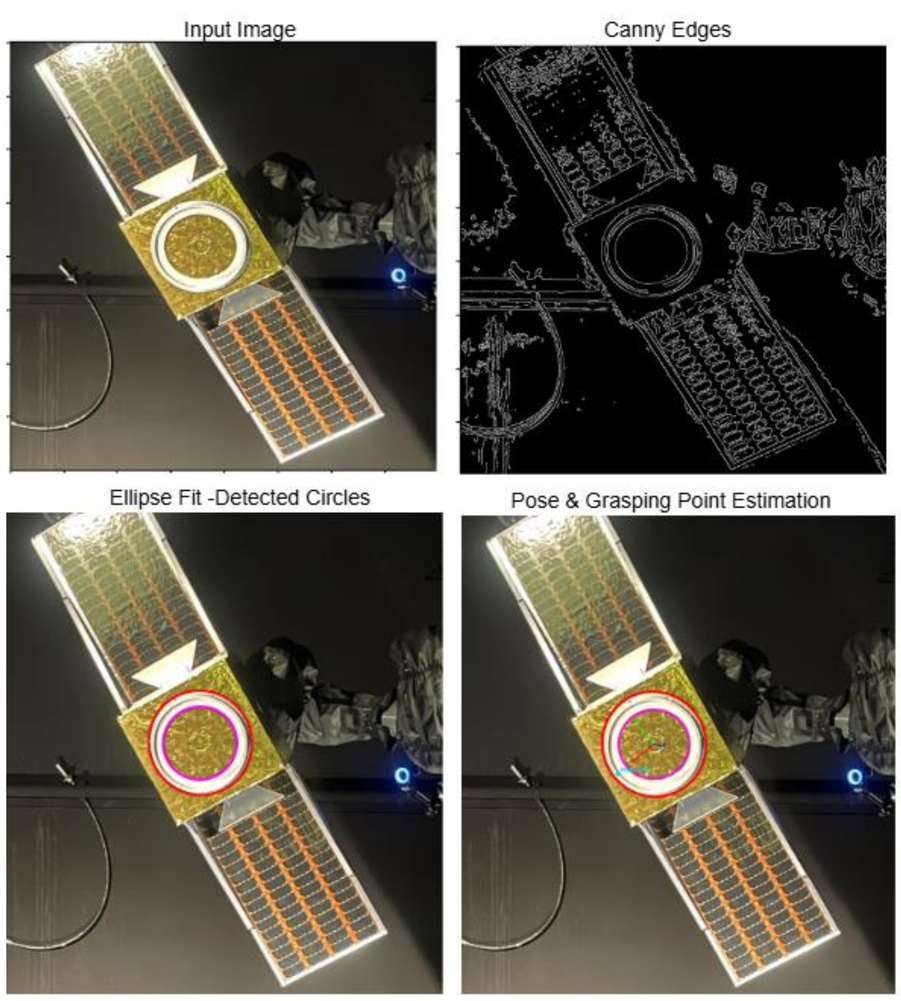
Hybrid Visual Servoing



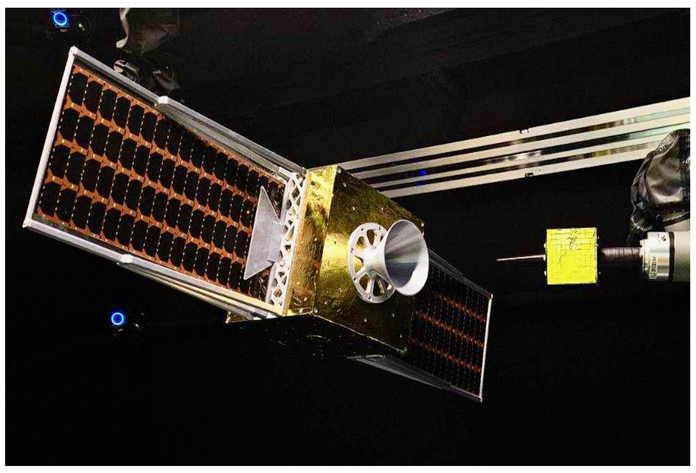


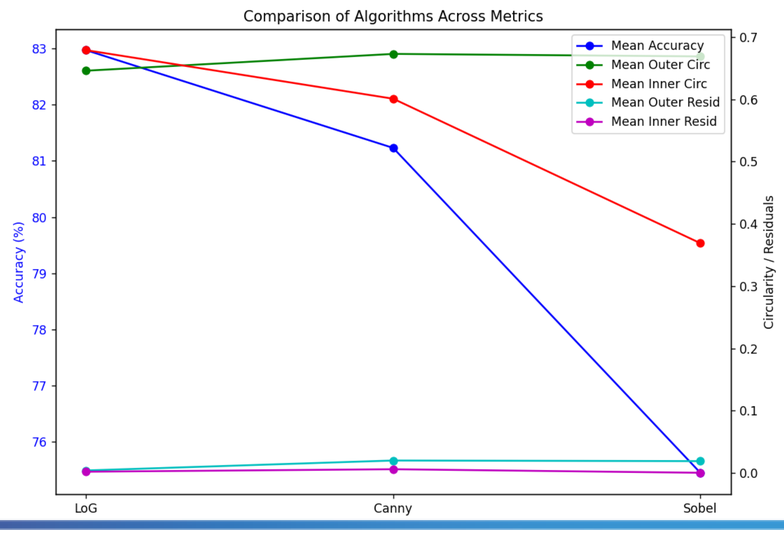
Launch Adaptor Ring Detection and Pose Estimation





The ZeroG Lab at UniLu





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