FRR: CAREER: Active Bayesian Inference for Collaborative Robot Mapping

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Challenge

- Establish foundations for **Active Bayesian Inference**
- Develop robot curiosity mechanisms for exploration and active uncertainty reduction

Technical Approach

- **Task A**: formalize **Active Bayesian Inference** as an optimal control problem for multi-robot sensing policy synthesis
- **Task B**: apply the techniques of Task A to collaborative robot mapping

Education Plan

- Develop **Robot Proving Grounds (RPG),** open-source educational materials for robot autonomy education

Broader Impacts

- Demonstration of active mapping using a team of ground and aerial robots
- Outreach and research activities for underrepresented K12 and undergrad students using RPG platform and support from UCSD outreach programs

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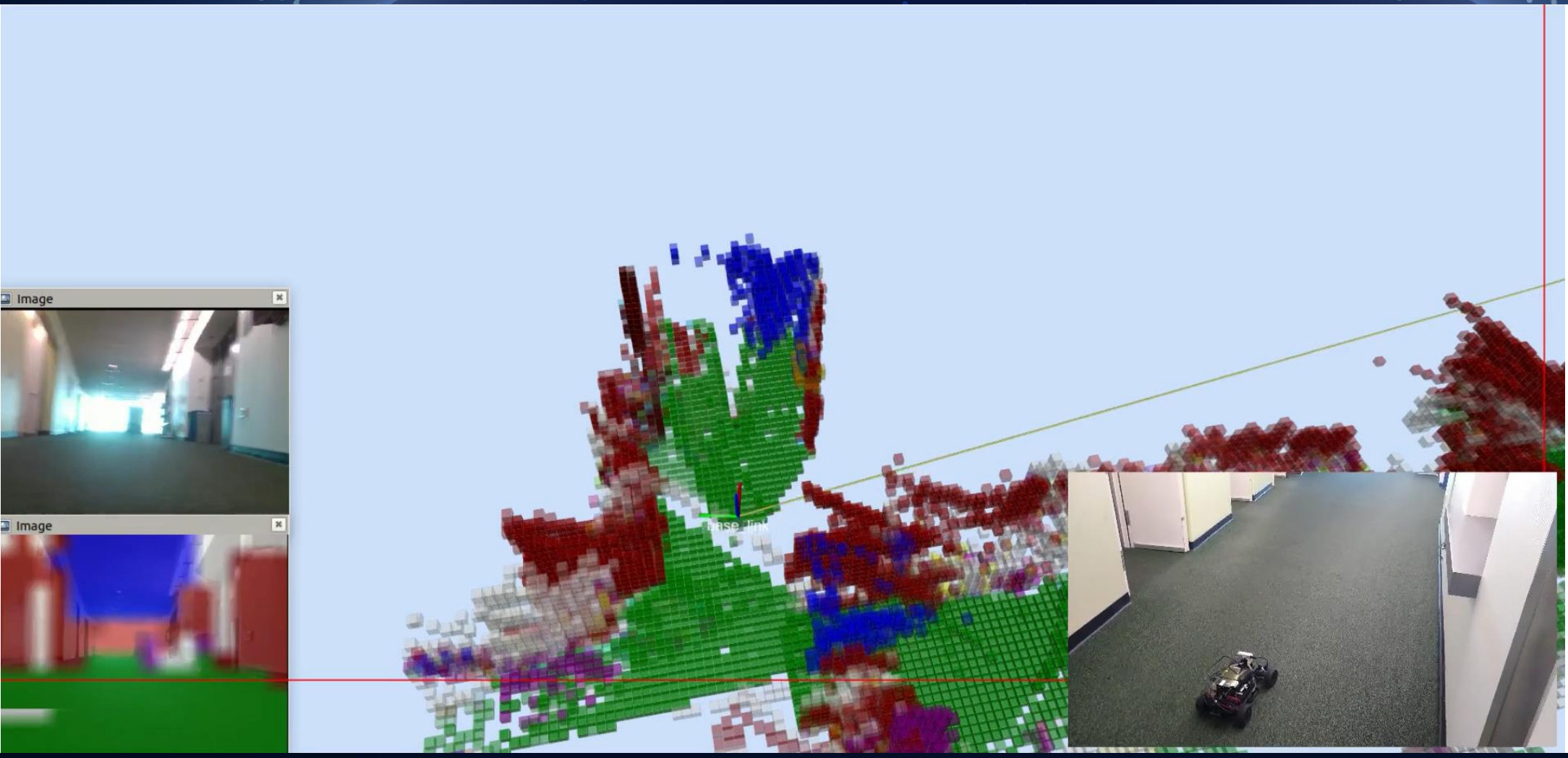
Active Bayesian Inference for Metric-Semantic Mapping



A. Asgharivaskasi, N. Atanasov, **"Semantic OcTree Mapping and Shannon Mutual Information Computation for Robot Exploration,"** Submitted to IEEE T-RO