The Multi-State Constraint Kalman Filter

Or, an exciting presentation that you should totally stay awake for

Valentin Peretroukhin and Lee Clement

AER1513 Course Project

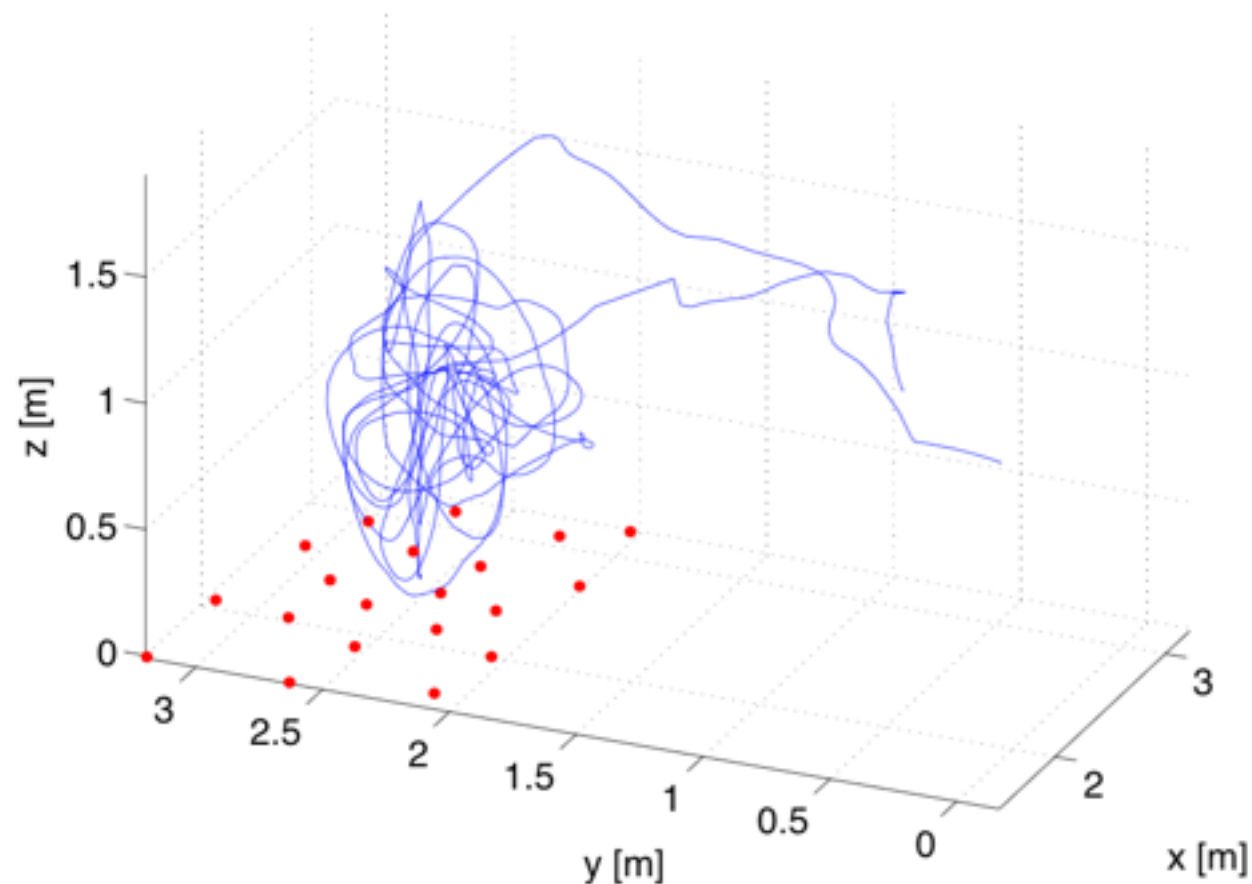Institute for Aerospace Studies
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Problem: Monocular Visual-Inertial SLAM

Some text
  Some other text

Dataset: Starry Night (Assignment 3)

- ☑ Perfect data association
- ☑ Ground truth for landmark positions
- ☑ Pre-integrated IMU measurements

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Algorithm: MSCKF

Idea: Pairwise landmark triangulation ignores correlations with other states, so use a hybrid batch/recursive filter

Batch component: Wait until all observations of a landmark are available (i.e., feature goes out of view), then compute its position using multi-view geometry

Recursive component: Use the batch landmark solutions as measurements in an Extended Kalman Filter

Advantages over plain EKF:
- **Optimal pose estimation** by incorporating all constraints
- **Computational complexity is linear** in number of landmarks instead of cubic

Progress

Questions?

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