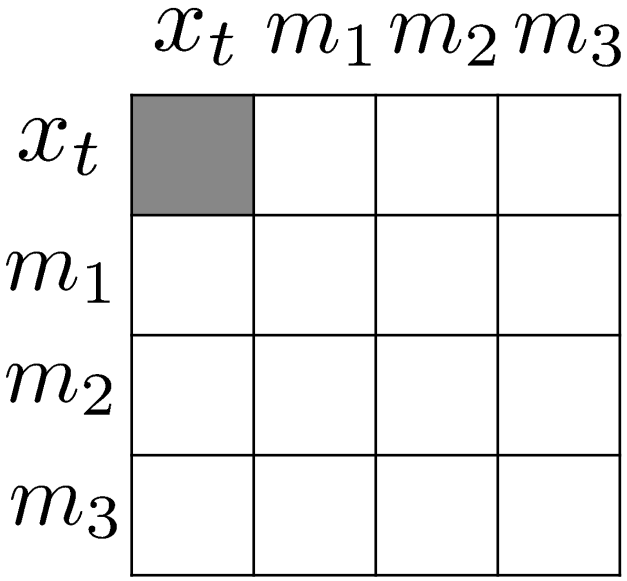
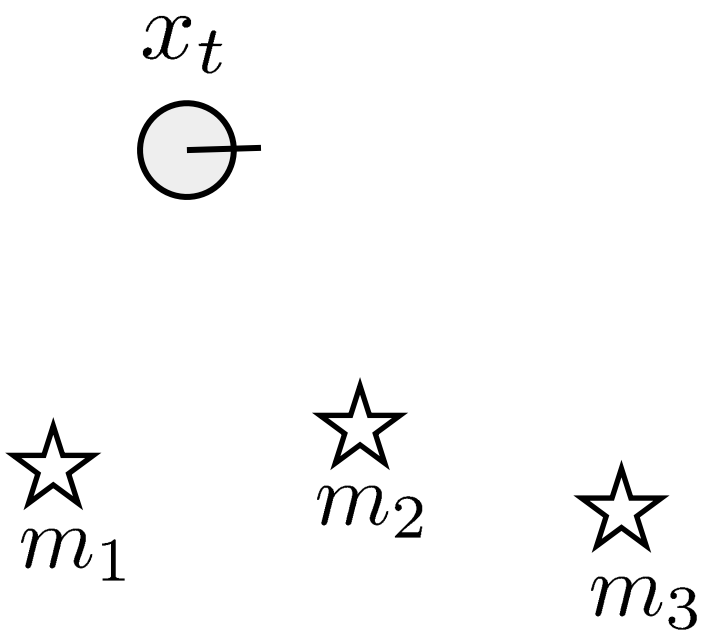
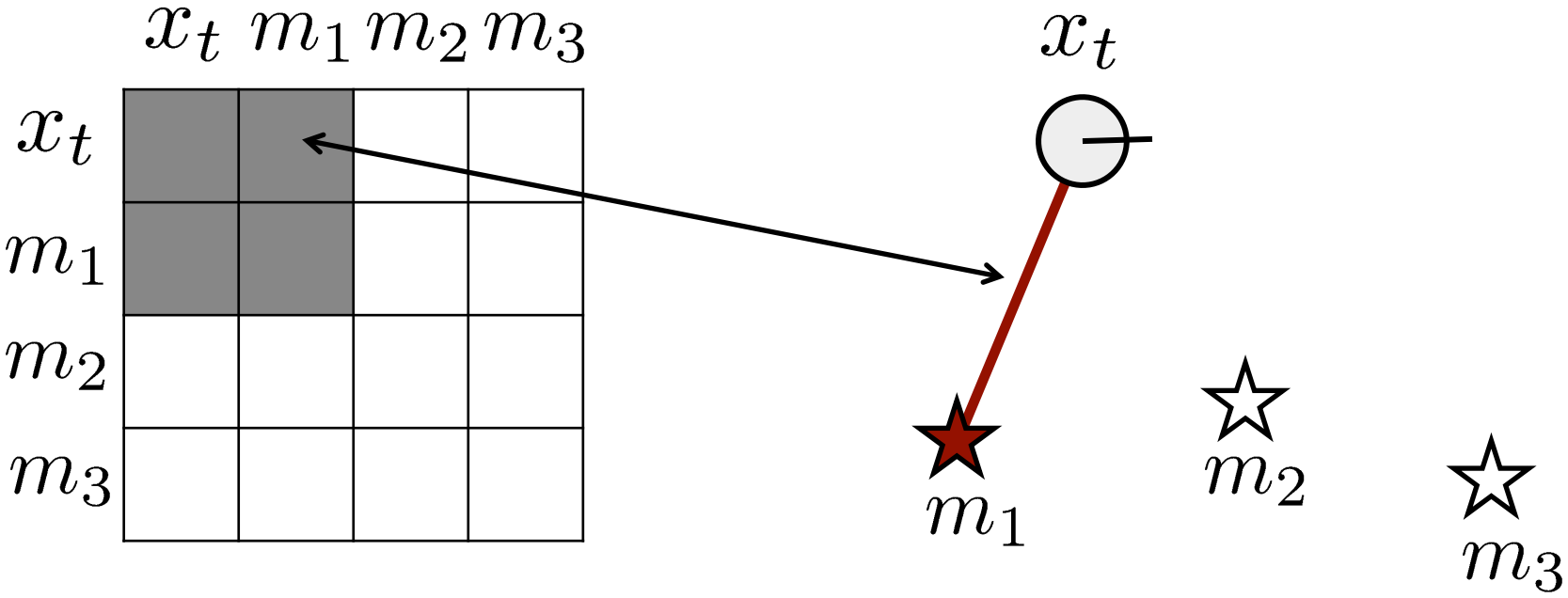
Effect of Measurement Update on the Information Matrix





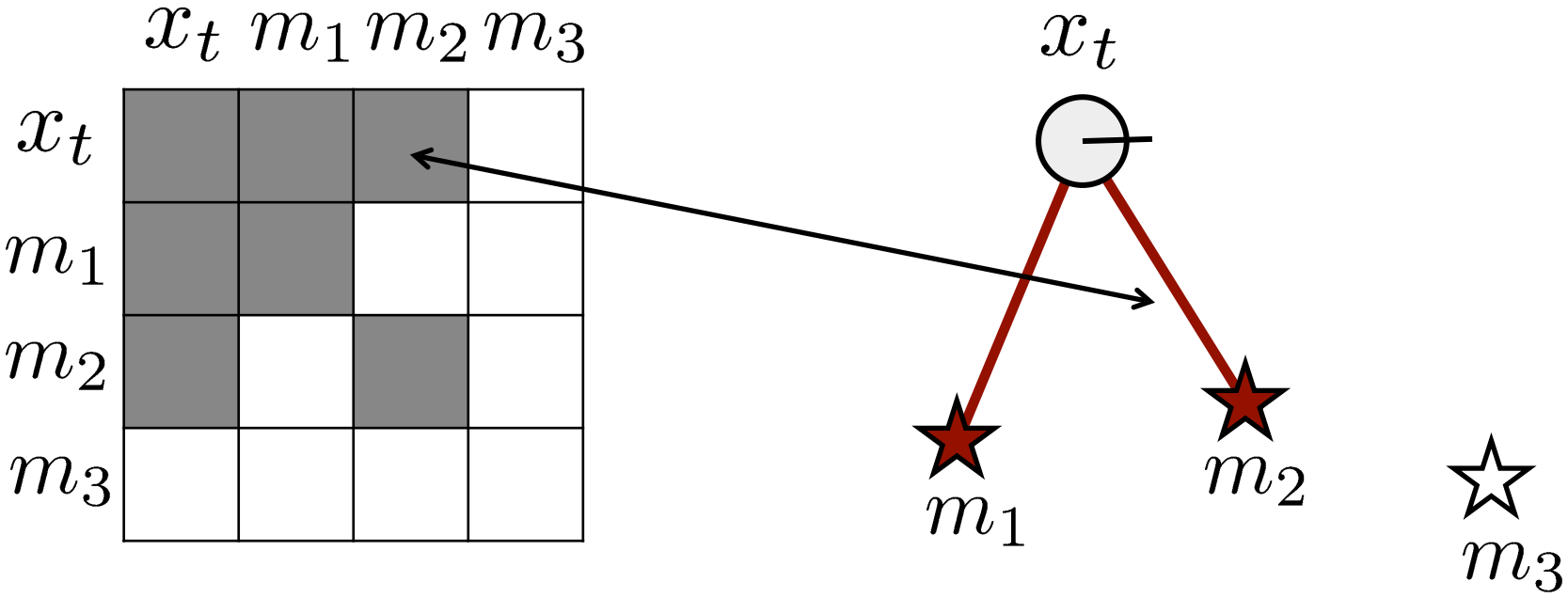
before any observations

Effect of Measurement Update on the Information Matrix



robot observes landmark 1

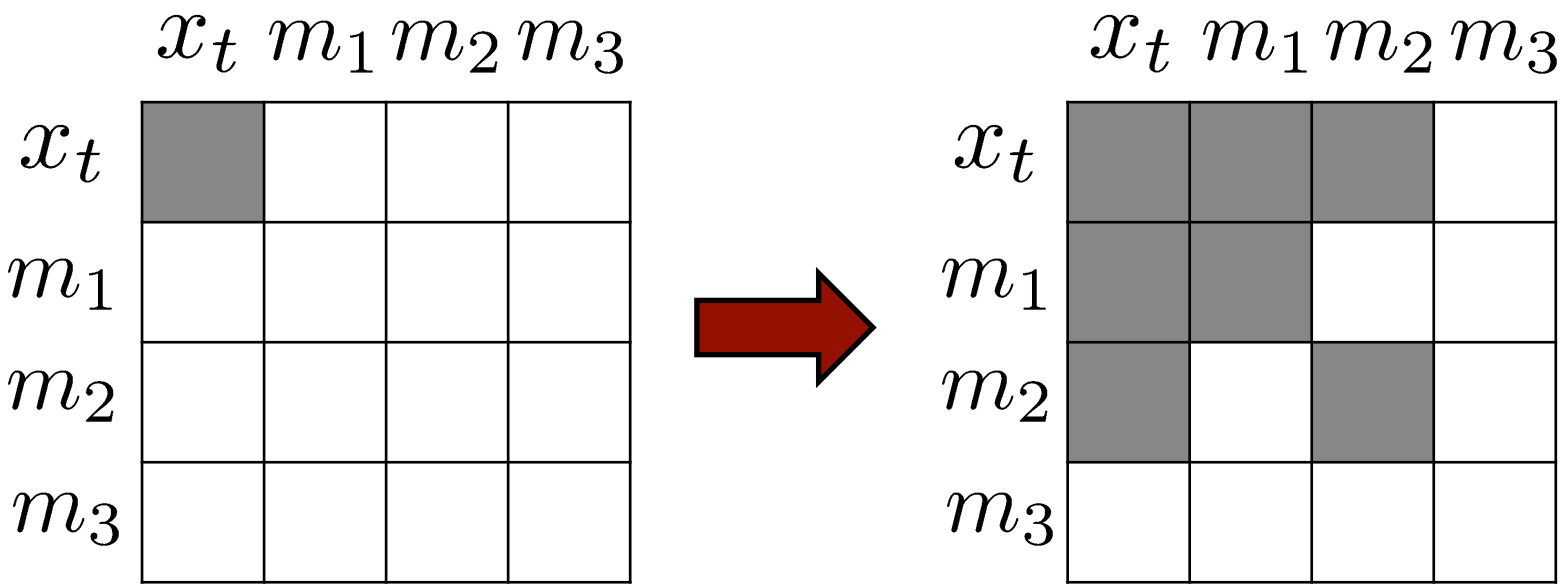
Effect of Measurement Update on the Information Matrix



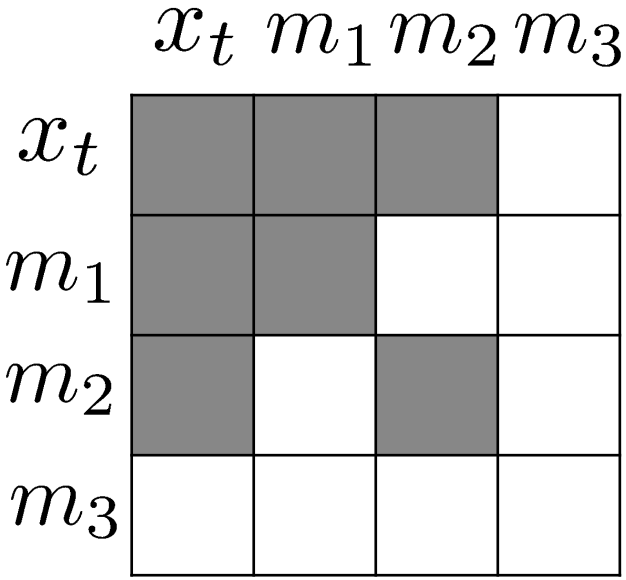
robot observes landmark 2

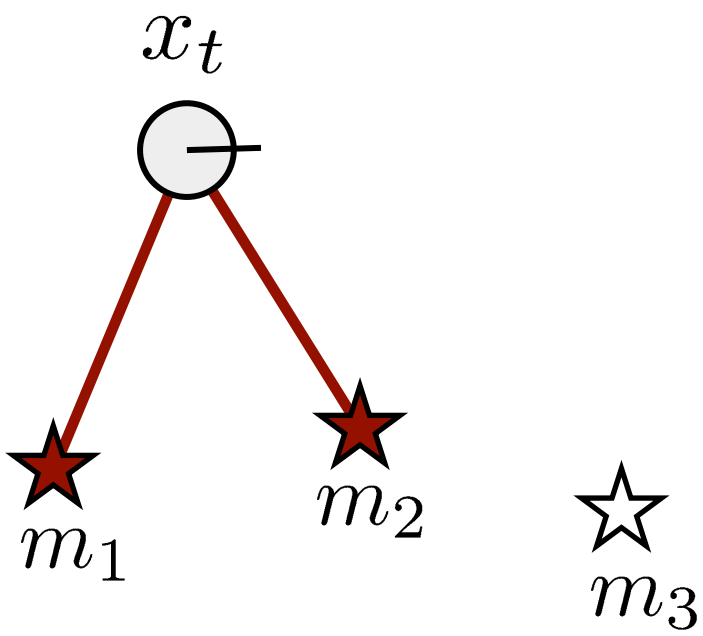
Effect of Measurement Update on the Information Matrix

- Adds information between the robot's pose and the observed feature



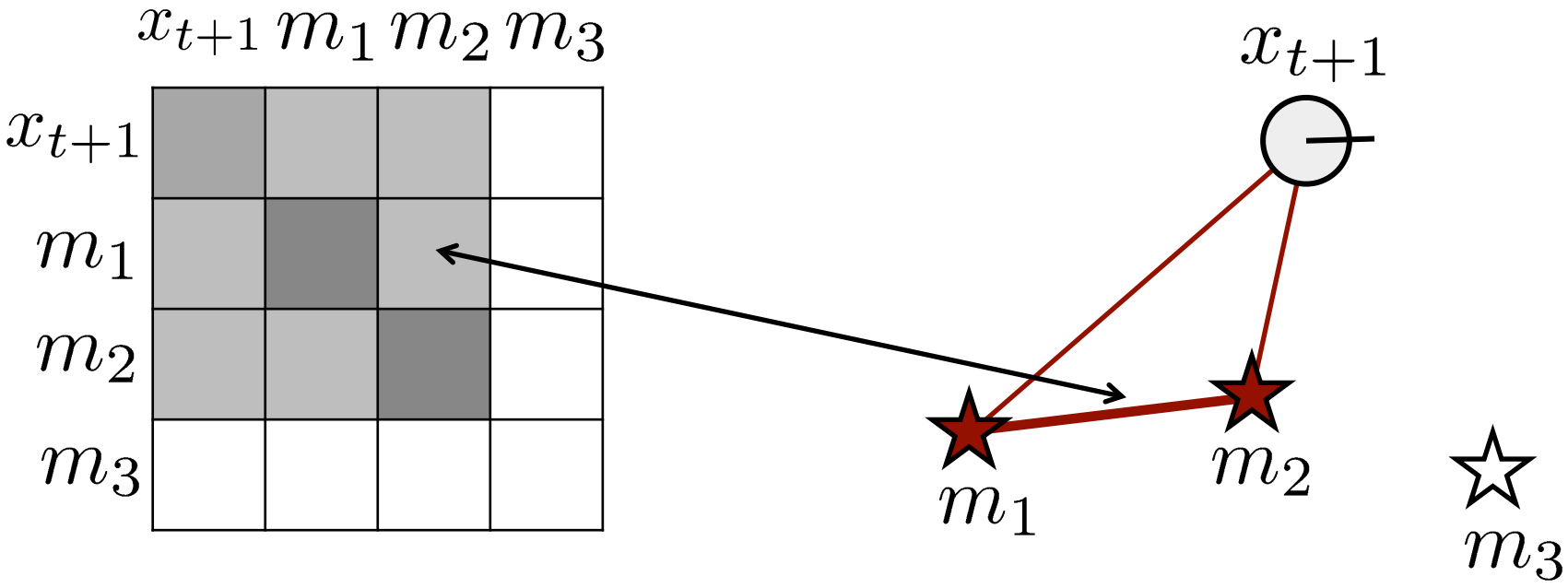
Effect of **Motion** Update on the Information Matrix





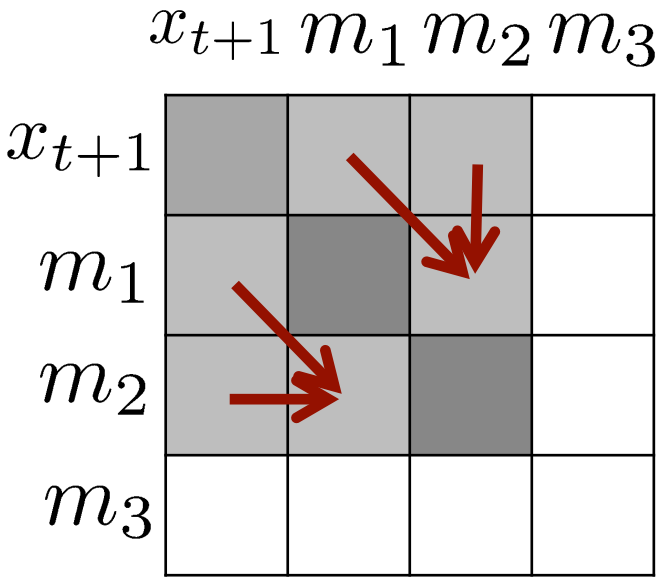
before the robot's movement

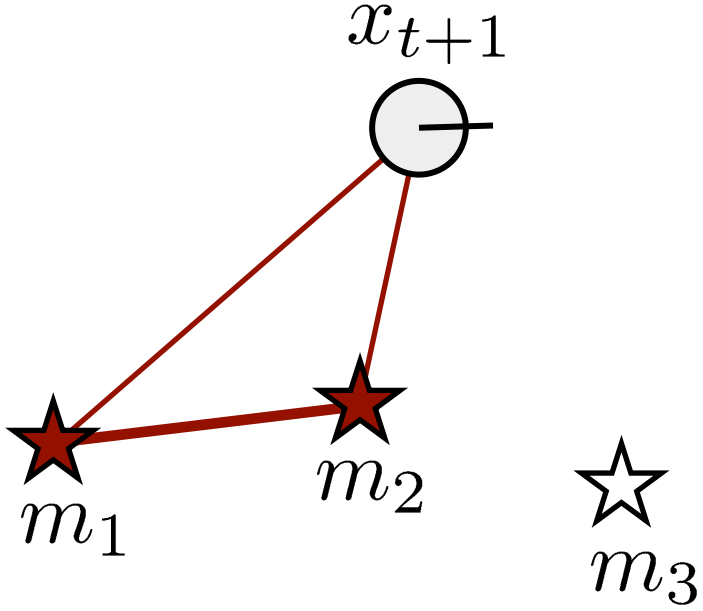
Effect of Motion Update on the Information Matrix



after the robot's movement

Effect of Motion Update on the Information Matrix

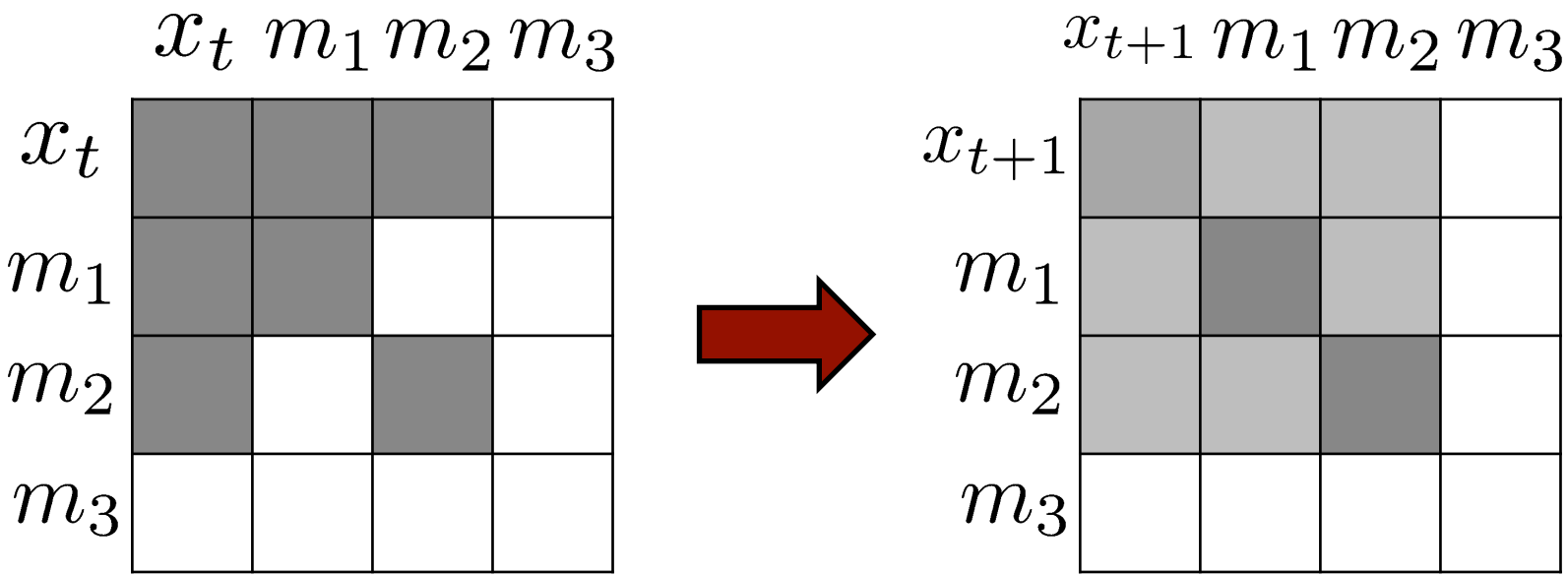




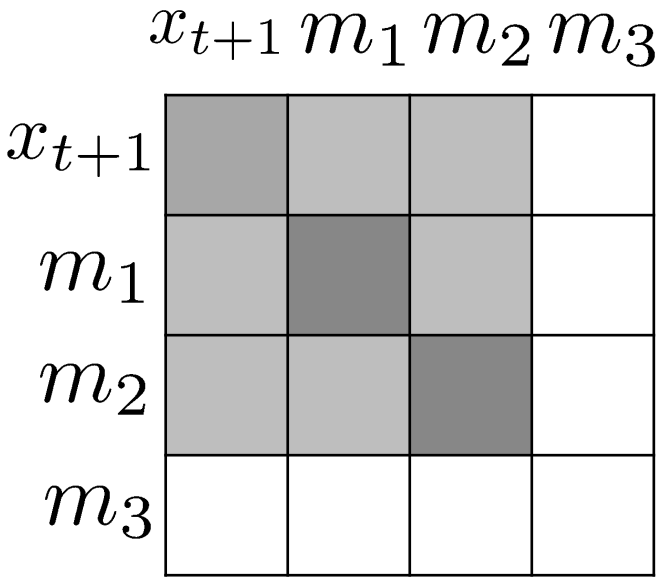
effect of the robot's movement

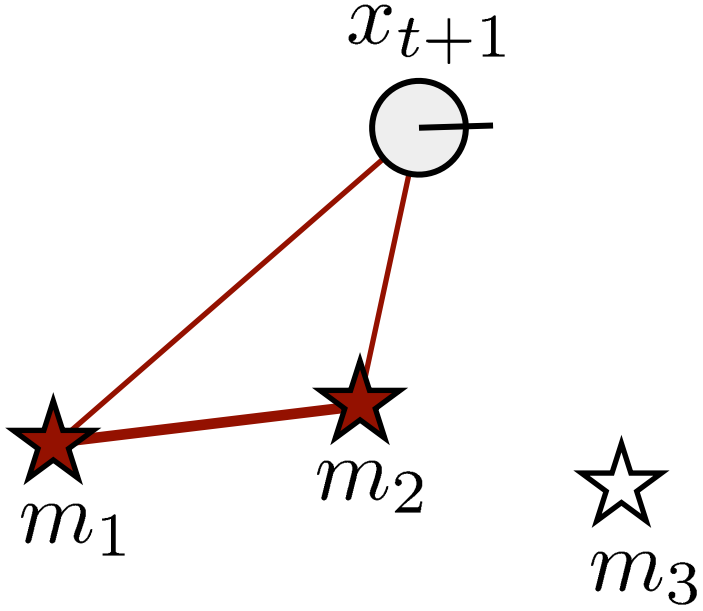
Effect of Motion Update on the Information Matrix

- Weakens the links between the robot's pose and the landmarks
- Add links between landmarks



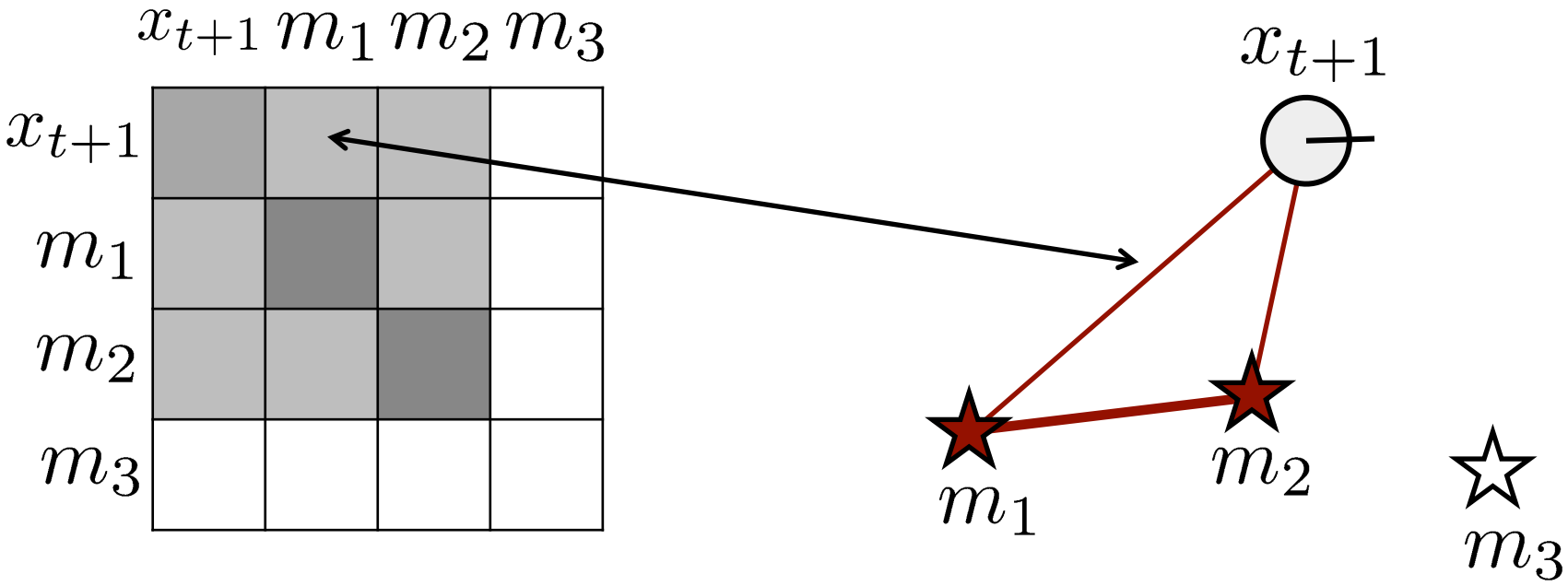
Sparsification





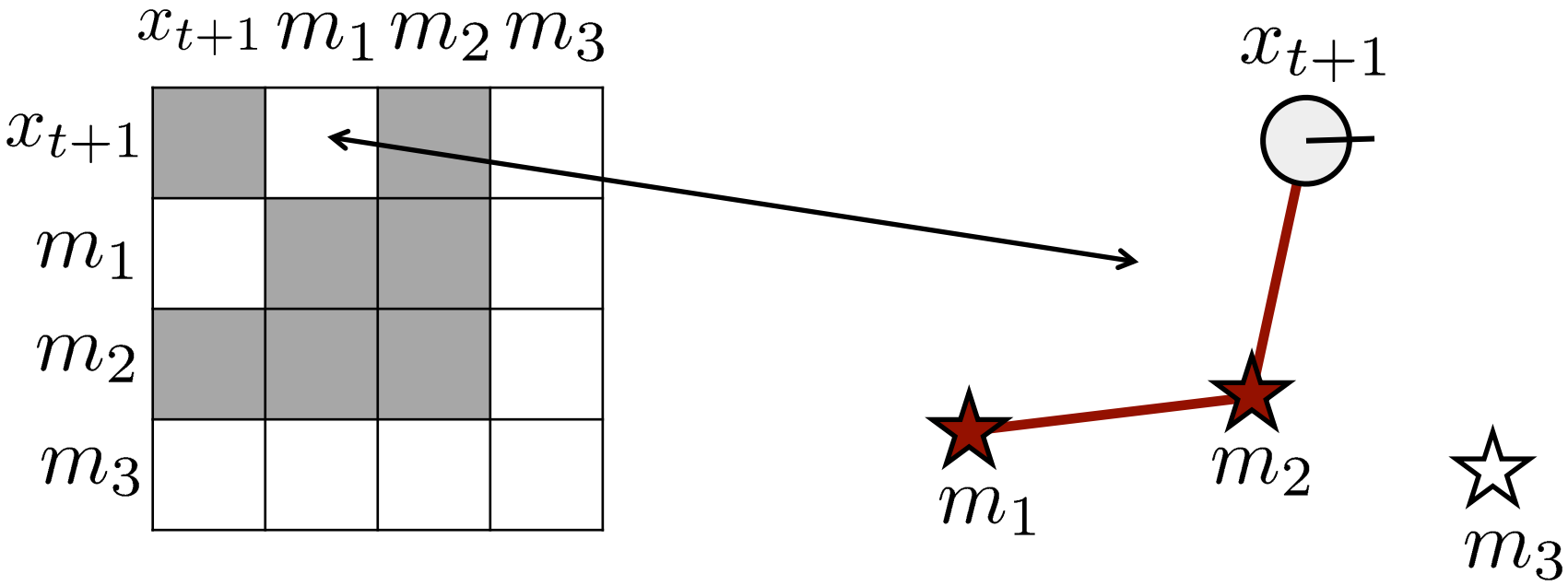
before sparsification

Sparsification



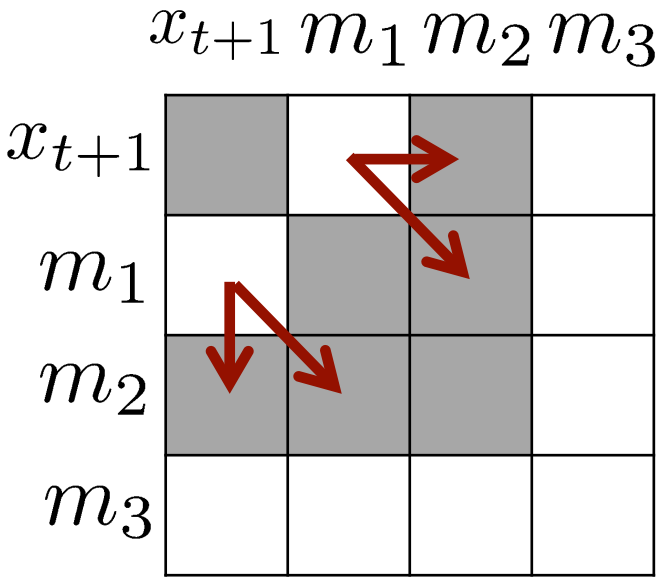
before sparsification

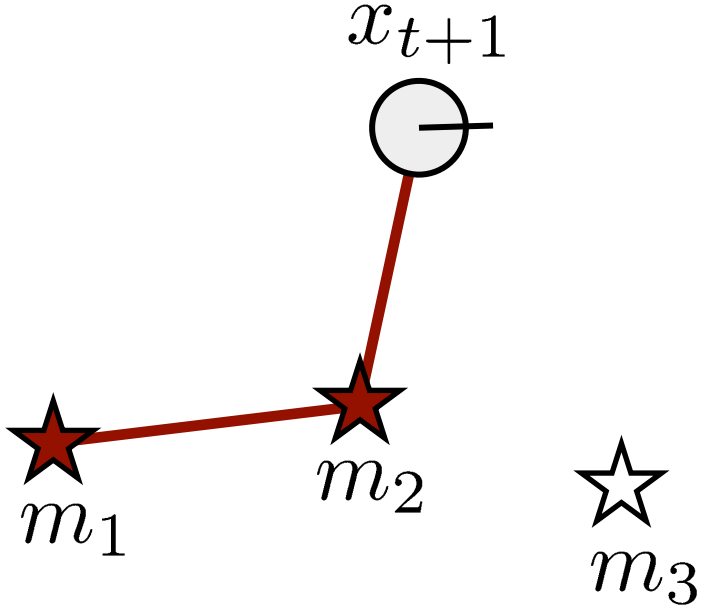
Sparsification



removal of the link between m_1 and x_{t+1}

Sparsification

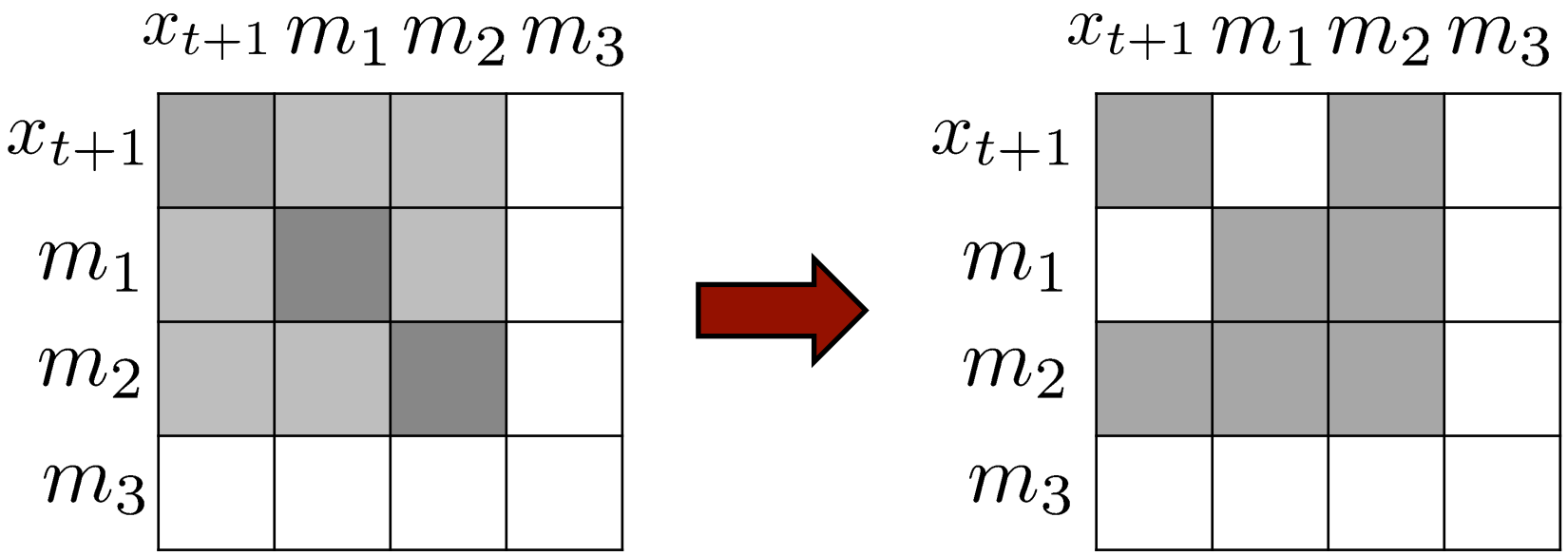




effect of the sparsification

Sparsification

- Sparsification means "ignoring" links (assuming conditional independence)
- Here: links between the robot's pose and some of the features



Active and Passive Landmarks

Key element of SEIF SLAM to obtain an efficient algorithm

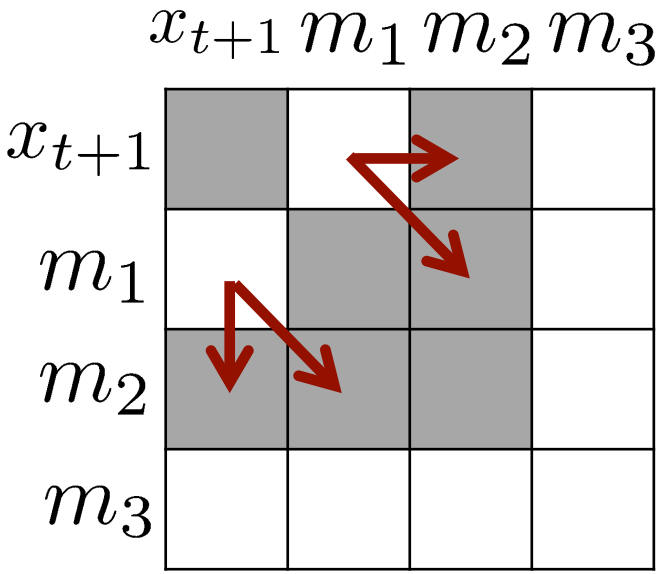
Active Landmarks

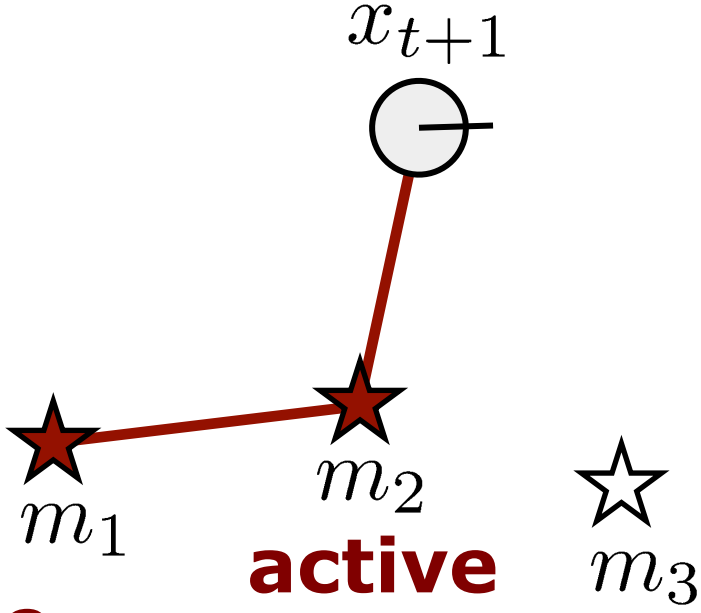
- A subset of all landmarks
- Includes the currently observed ones

Passive Landmarks

- All others

Active vs. Passive Landmarks





was active, now passive

active

passive