

Sensor Fusion and Object Tracking with MATLAB

OEM: MathWorks • Duration: 1 Day (8 hrs) • Code: MW-SENSOR-FUSION-AND-OBJECT-TRACKING-WIT

COURSE MODULES & TOPICS

Day 1 of 1

Localization for Orientation and Position

- Model measurements from accelerometers, gyroscopes, magnetometers, and GPS.
- Fuse sensor data to estimate the pose in terms of position, velocity, and orientation.
- Visualize the pose estimation and plot platforms and trajectories.

Scene Generation and Detection Import

- Preprocess and package collected sensor detections.
- Create a tracking scenario with multiple sensors and platforms.
- Define waypoint or kinematic trajectories.
- Customize sensor parameters.
- Generate detections used in sensor fusion algorithms.

Filters and Motion Models

- Evaluate filters against scenario requirements.
- Compare and contrast different motion models.
- Configure an Interacting Multiple Model (IMM) filter to track different maneuvers.

Data Association

- Select from among Global Nearest Neighbor (GNN), Joint Probabilistic Data Association (JPDA), Track-Oriented Multiple Hypothesis (TOMHT), and other data association methods.
- Determine how multiple detections are assigned to different tracks.

Multi-Object Trackers

- Configure trackers and parameters.
- Perform track association and management.
- Visualize the tracked objects.

Appendix A: Trackers for Passive Sensors

- Triangulate multiple line-of-sight detections.
- Perform static fusion of passive synchronous sensor detections.
- Track with range-only measurements.

- Track with angle-only measurements.