Multiple Object Tracking: Course Outline

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Outline

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Introduction

- Definitions
- Types of Tracking.
- Challenges in MOT.

Outline

Bayesian Filtering

- Bayes Theorem
- Prediction and Update Recursion

Outline

Motion Modeling

- Object motion model
- Modeling in uncertainty

Outline

Measurement Modeling

- Sensor measurement model
- Measurement Uncertainties

Outline

Kalman Filter

- Introduction to the Kalman filter
- Practice problem

Outline

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2. Single Object Tracking
   - Introduction
   - Prediction & Measurement Updates
   - Clutter Modeling
   - Data Association
   - Algorithms
   - Gating

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   - Introduction
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Introduction

- Brief introduction to Single Object Tracking (SOT).
- Challenges in SOT.

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   - Clutter Modeling
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   - Algorithms
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Prediction & Measurement Updates

- Prediction & Measurement Update for a single object

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Clutter Modeling

- Introduction
- Modeling clutter in space

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Data Association

- Data association in SOT in the presence of clutter

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Algorithms

- Nearest Neighbors
- Probabilistic Data Association
- Gaussian Sum Filtering

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Gating

- Removal of unwanted hypotheses.

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4 Random Finite Sets
- Introduction
- Common Random Finite Sets
- Standard Models in MOT
- Probabilistic Hypothesis Density Filtering
- Metrics in MOT

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