Multiple Object Tracking: Course Outline

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Outline

1. **Tracking**

2. **Single Object Tracking**

3. **Multiple Object Tracking**

4. **Random Finite Sets**

5. **Multiple Object Tracking Using Conjugate Pairs**

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1. **Tracking**
   - Introduction
   - Bayesian Filtering
   - Motion Modeling
   - Measurement Modeling
   - Kalman Filter: A Bayesian Filtering Example

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2. Single Object Tracking
   - Introduction
   - Prediction & Measurement Updates
   - Clutter Modeling
   - Data Association
   - Algorithms
     - Nearest Neighbors
     - Probabilistic Data Association
     - Gaussian Sum Filtering
   - Gating

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3. ### Multiple Object Tracking
   - Introduction: n Object Tracking
   - n Object Measurements Modeling
   - Estimating n Object Density
   - n Object Data Association
   - Algorithms: n Object Tracking
     - Global Nearest Neighbors (GNN)
     - Joint Probability Density Association (JPDA)
   - Multi Hypothesis Tracker

Outline

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

Tracking
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Labels

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5. Multiple Object Tracking Using Conjugate Pairs
   - Introduction
   - Modeling a Changing Number of Objects
   - Multi-Bernoulli Mixture Filter
   - Poisson Multi-Bernoulli Mixture Filter
   - MOT Filter Implementation
   - Labels

Labels