Motivation and Sensor Setup

Avoid collisions with crossing pedestrians (PEDs):
- Detection of gait initiation and prediction of the PED’s trajectory
- Issue an intersection Decentralized Environmental Notification (iDEN)

Perception at crosswalks:
- 2 stationary mounted High-Definition video-sensors HD1, HD2, operating @ 50 Hz
- 4 eight-layer laser scanners operating @ 12.5 Hz

Method

![Diagram of sensor setup and data flow]

- **HD1 Data**
- **Laserscanner Data**
- **HD2 Data**

**Hypothesis Generation**
- HOG Pedestrian Detection HD1
- HOG Pedestrian Detection HD2

**Object Management, IMM-EKF Tracking and Fusion**
- PDO Generation
- iDEN Generation

**iDEN triggered by motion pattern classification using Interacting Multiple Model Extended Kalman Filter (IMM-EKF), constant velocity (CV) model probability and MCHOG starting probability to detect initiation of gait:**
- Edge-Based Motion History Image
- Motion Contour HOG-like descriptor (MCHOG)

**iDEN trajectory prediction:**
- Piecewise linear velocity model
- Gait parameters derived from video data captured at the Ko-PER intersection


Results

**Intention Detection**

**Trajectory Prediction**
