REU: Week 8

Scene Motion Patterns from Optical Flow

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This week

- Problems with Kernel Density Estimation
  - Requires all data points to be saved
  - 11,000 frames, >30,000 data points per frame
- Possible hierarchical model
  1. Short clip of frames (10 frames)
  2. Related motion over multiple clips (making a turn, going straight)
  3. Periodic motion patterns
Clustering

- (x,y,u,v) points from 10 frames
- K-means
- Ellipses – spatial extent of cluster (2 SD)
Finding similar clusters
Horizontal example
Vertical example
Thoughts

- Low-level clustering
  - Results appear meaningful
  - Simpler representation
- Next step in hierarchical model
  - Find consistent motions over consecutive time clips (not hard)
  - Identify these as recurring patterns (hard)