Defining Gestures from Optical Flow: Week 7

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Current Progress and Goals

Recent Progress

- Created a new modification of Longuet-Higgins egomotion equations to use in multiple camera systems

Current Goal: Create a working gesture recognition system

- Model optical flow data constistent with camera system
- Determine egomotion combinations that are not possible or likely with camera system
- Define specific gestures

Generated Optical Flow - Rotation about z-axis

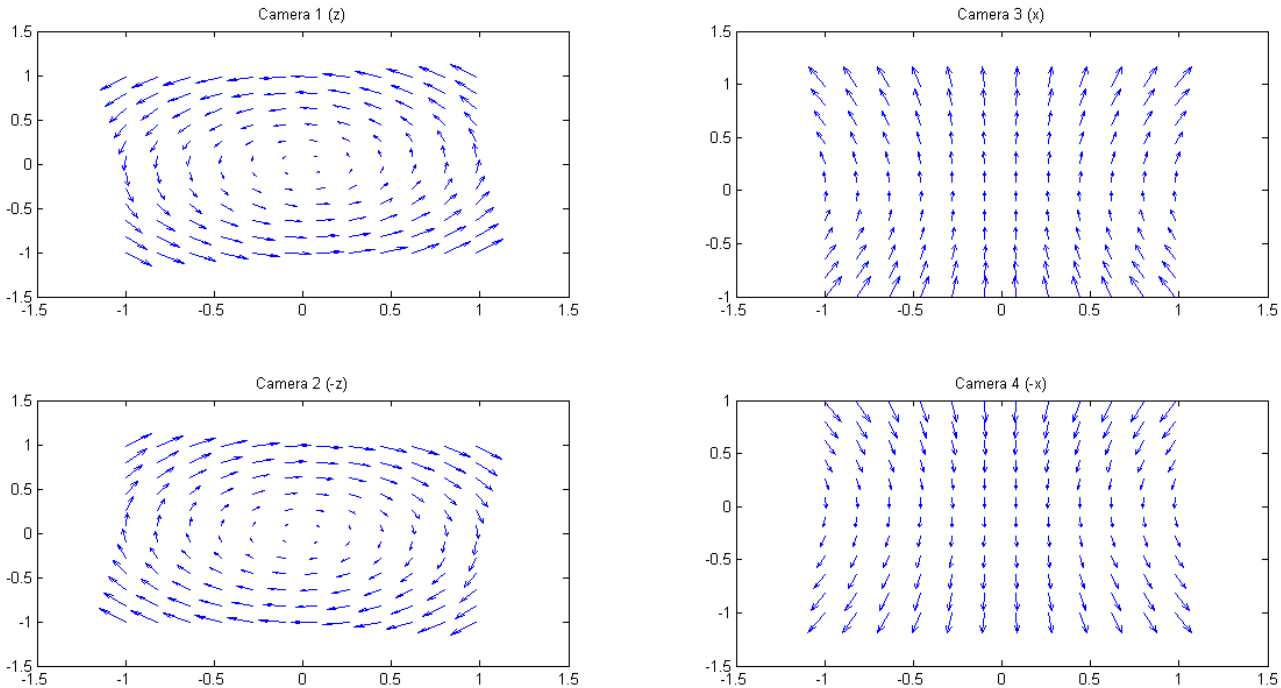

Figure: Optical Flow from Multi-camera equations (Longuet-Higgins equations modified)

Generated Optical Flow - Translation in positive x direction

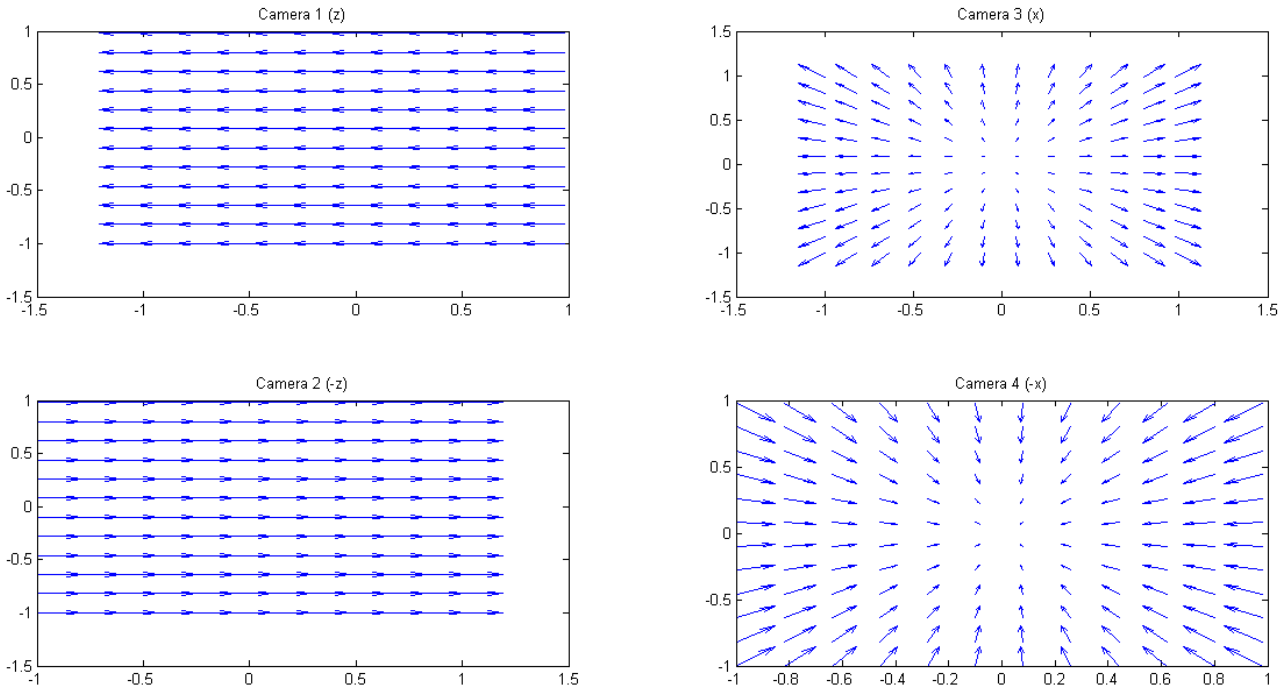

Figure: Optical Flow from Multi-camera equations (Longuet-Higgins equations modified)

System Model

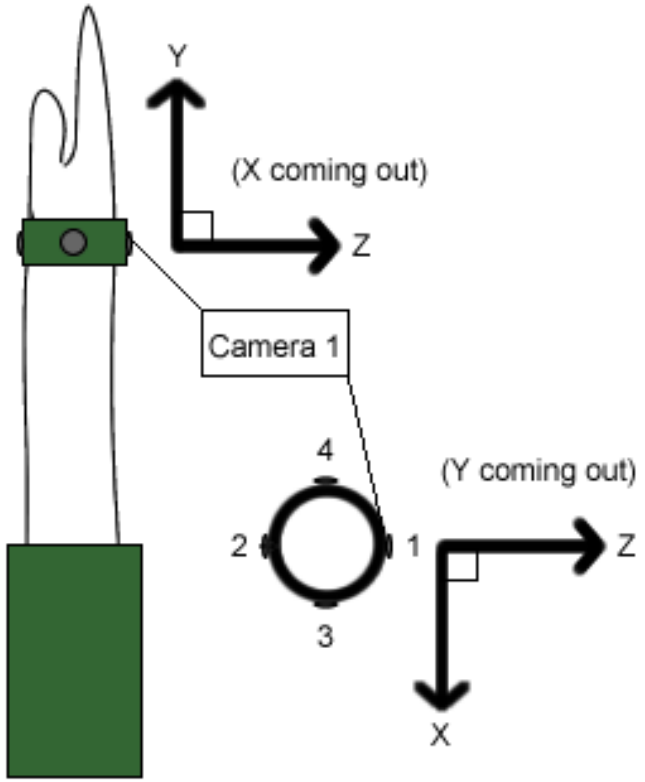

Figure: Convention when defining gestures and system

Generated Optical Flow - Thrust (y translation)

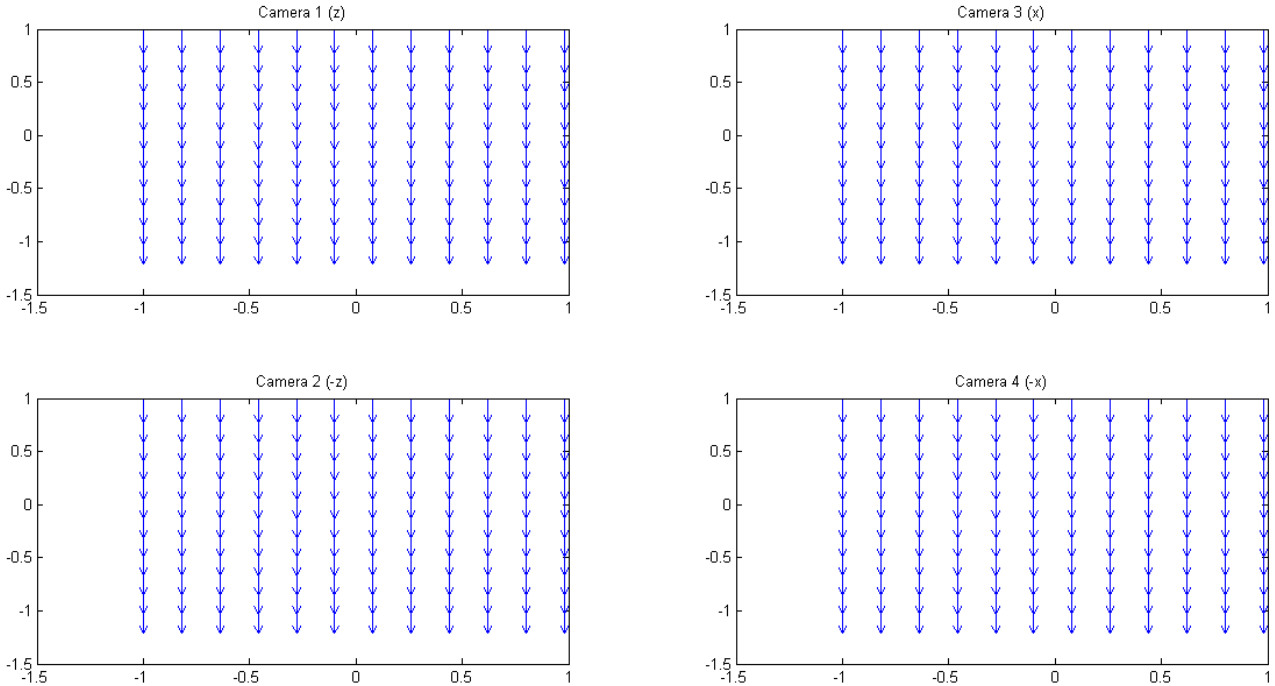

Figure: Optical Flow from Multi-camera equations (Longuet-Higgins equations modified)

Calculated Optical Flow - Thrust (y translation)

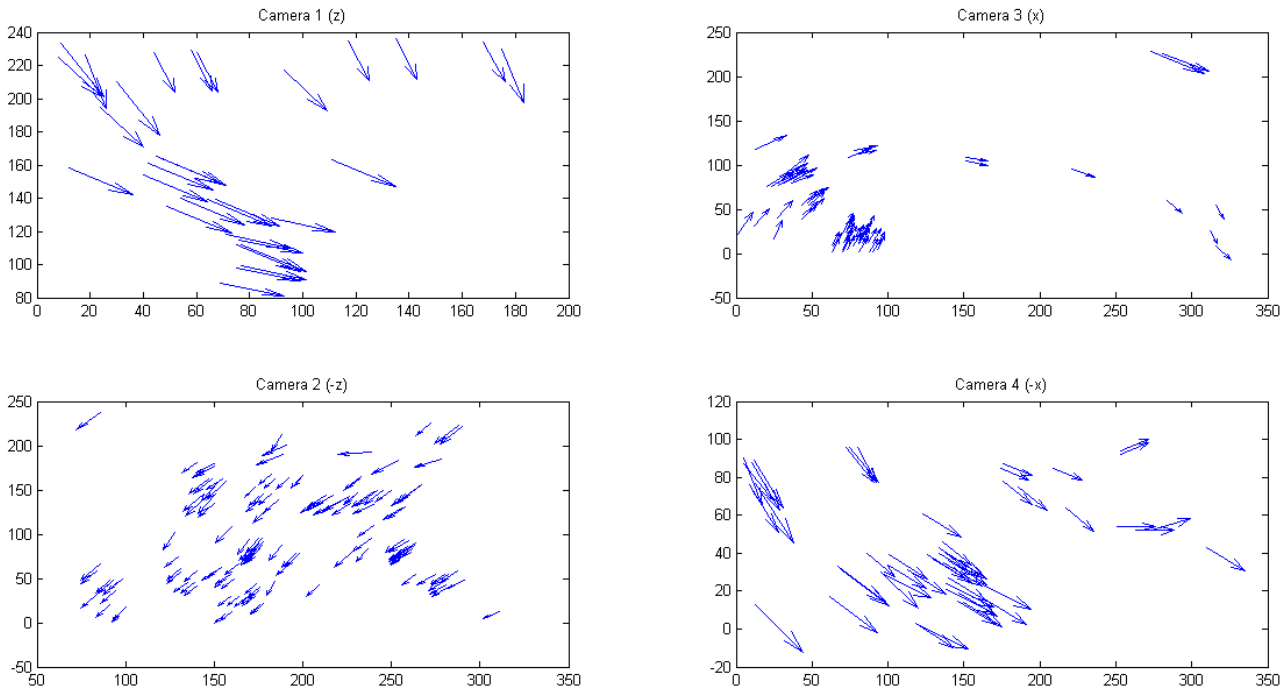

Figure: Optical flow from video

Eliminate Unlikely Egomotion

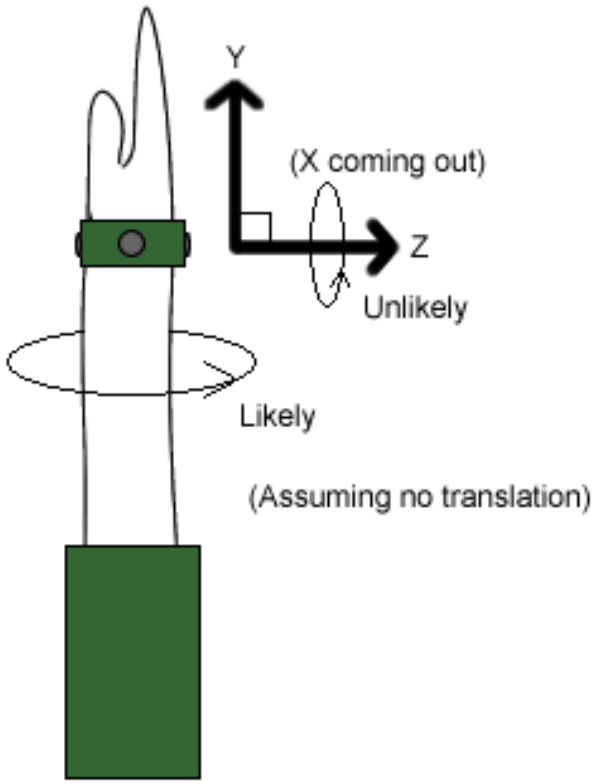

Figure: One Example of Unlikely Motion

Future Plans

- Create a space of likely egomotion parameters of which to map optical flow data
- Strictly define a set of gestures (thrust, wave, twist...)
- Construct a model for gesture recognition that is resiliant to variation and noise