



# Week 8

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# Last Week

- Experiences many data-collection problems
  - The Bumblebee camera does not work with FireWire ExpressCards
  - The Bumblebee requires a *powered* FireWire port, and most laptops does not provide this power
  - Most laptops have the 4-pin connector, but we only have the cables for the 6-pin
  - Write-speed issues

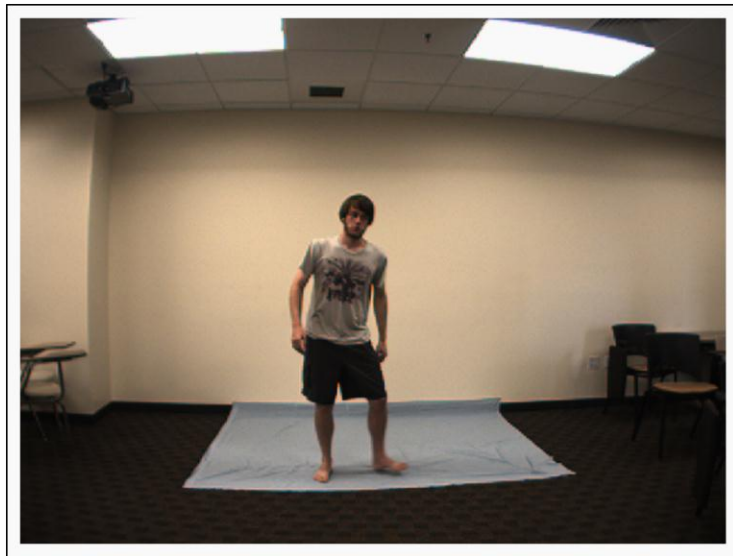
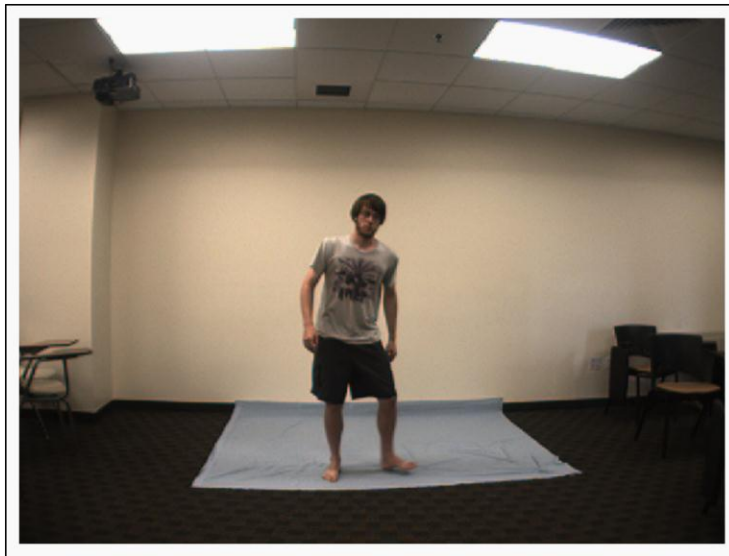
# Depth Reconstruction

- Fixed all the data collection issues 😊
  - I simply did what I proposed last week
  - Now I can record at 48 Hz (this is better than the original target 30 Hz)
- New computer (woot woot)
- Finished the depth reconstruction pipeline
  - Final depth videos are now smooth, much less noisy, and properly segmented
  - Also implemented a false-coloring stage in the pipeline
- Started implementing simple feature descriptor

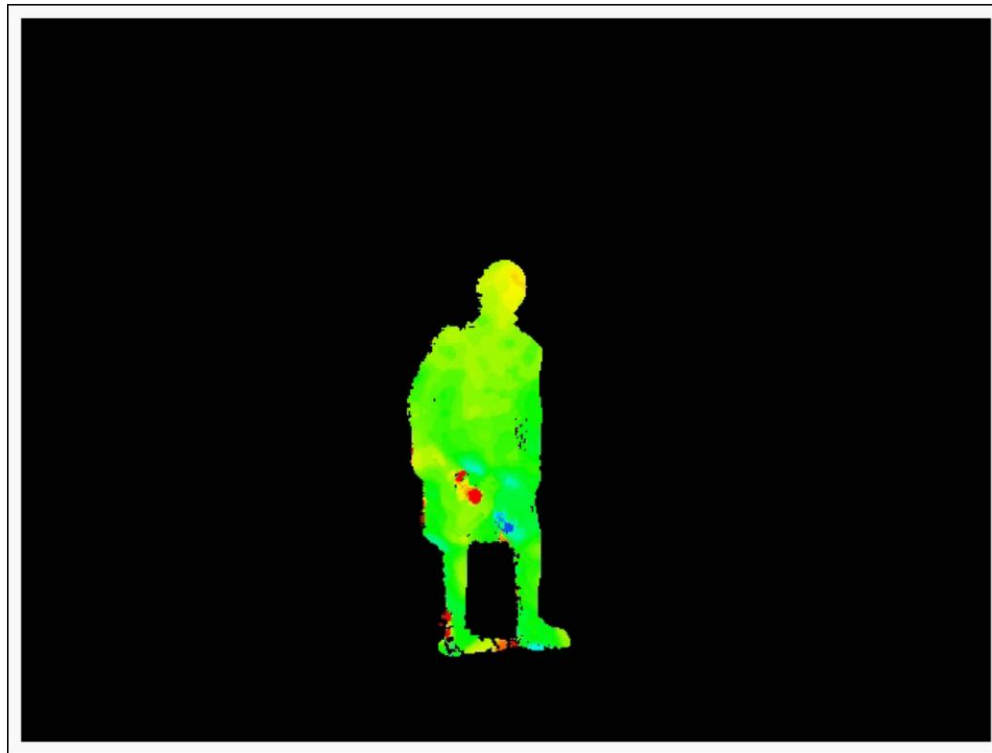
# Segmentation From Last Week



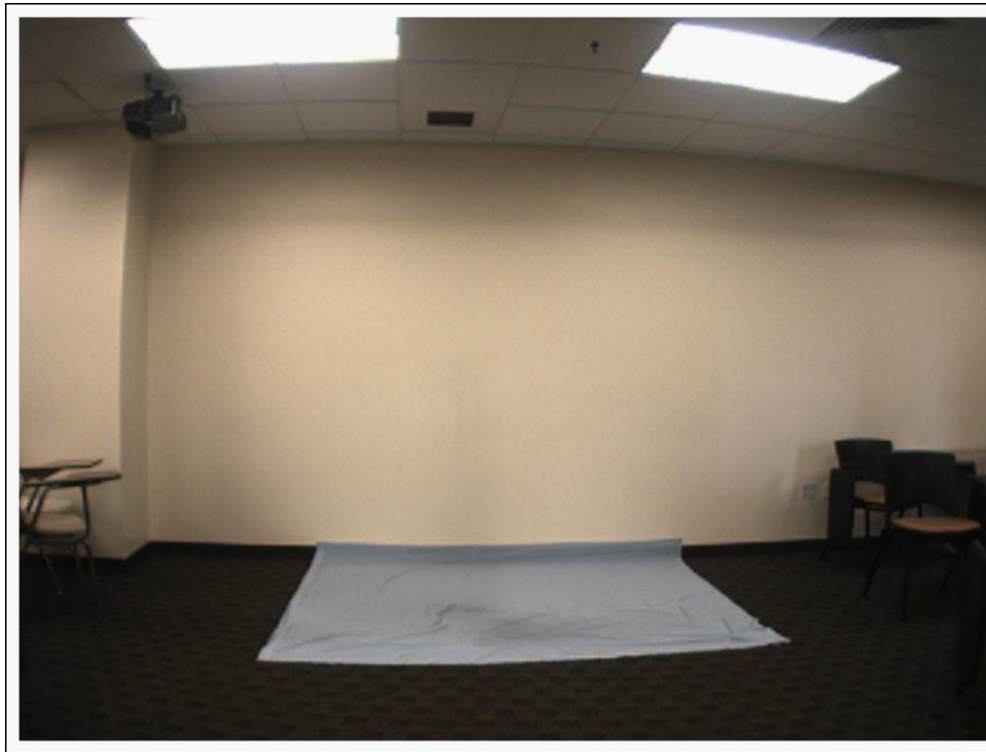
# Depth Reconstruction Pipeline



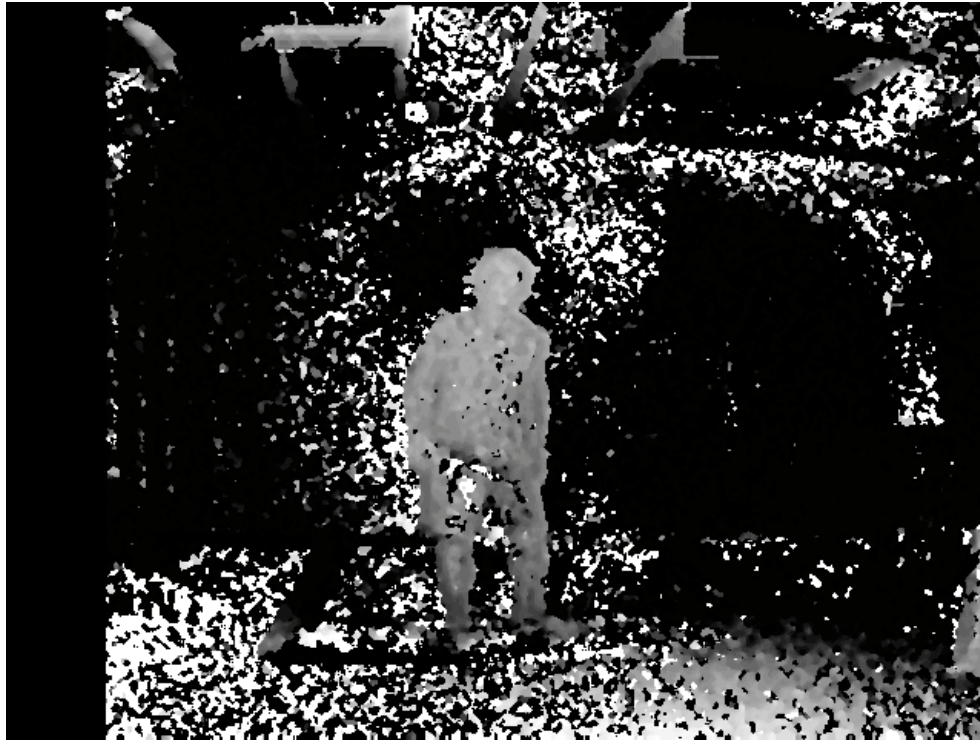
# Depth Reconstruction Pipeline



# Depth Reconstruction Pipeline

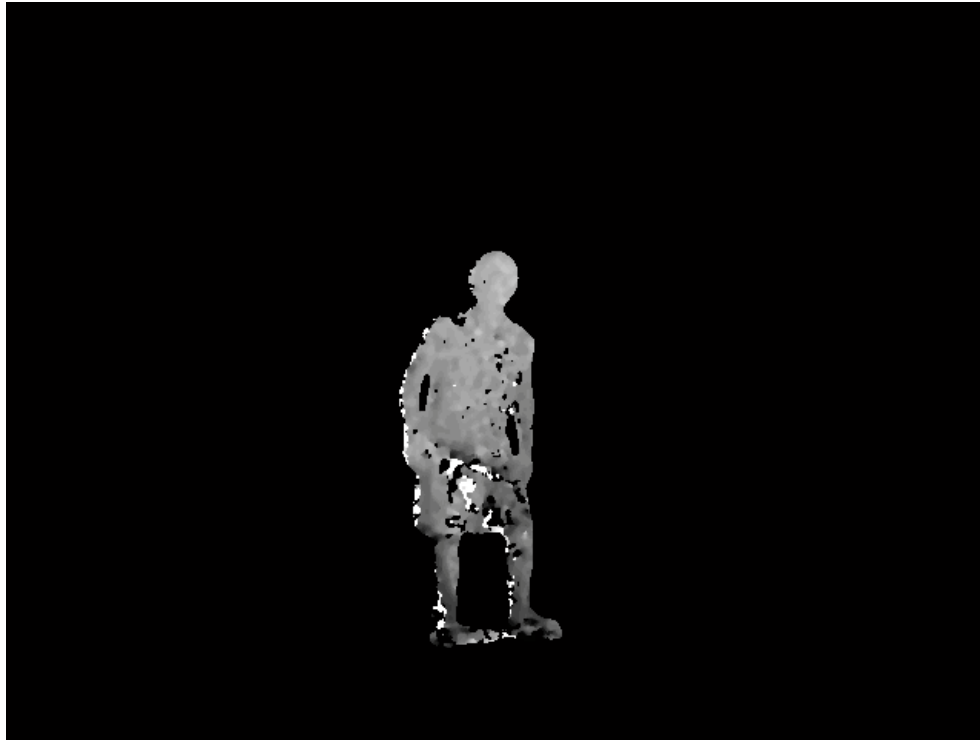


# Depth Reconstruction Pipeline

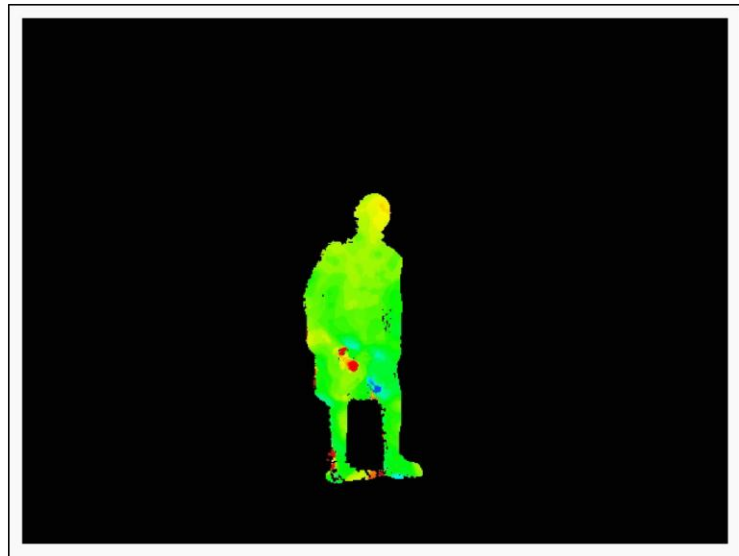
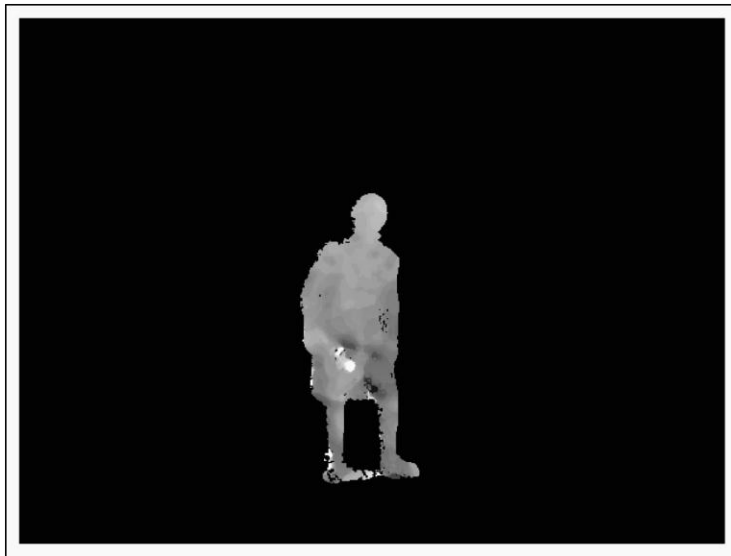




# Depth Reconstruction Pipeline



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# Depth Reconstruction Pipeline

- Compute depth with semi-global block matching algorithm
- Apply background subtraction
- Remove spatial “speckles”
- Lens distortion correction (the Bumblebee cameras have a barrel distortion)
- Remove temporal “speckles”
- Create psuedo-color videos for better visualization

# Semi-Global Block Matching

- Originally I said simple block-matching was better
- This was because SGBM produced significant noise
- Background subtraction removes most of this noise
- Also, SGBM more accurately shows the contour of the person (simple block matching tends to “blobify” people)

# Future Plans

- Gather the data early next week
  - I will send out an email about this (what clothes to wear etc.)
  - We will have instructional videos
- Implement a prototype feature descriptor
  - Probably based on a simple quadtree of bins
  - Needs to uniquely identify each action
- Write, train, and test an SVM-based classifier