Early Results of Movement Analysis using Orients

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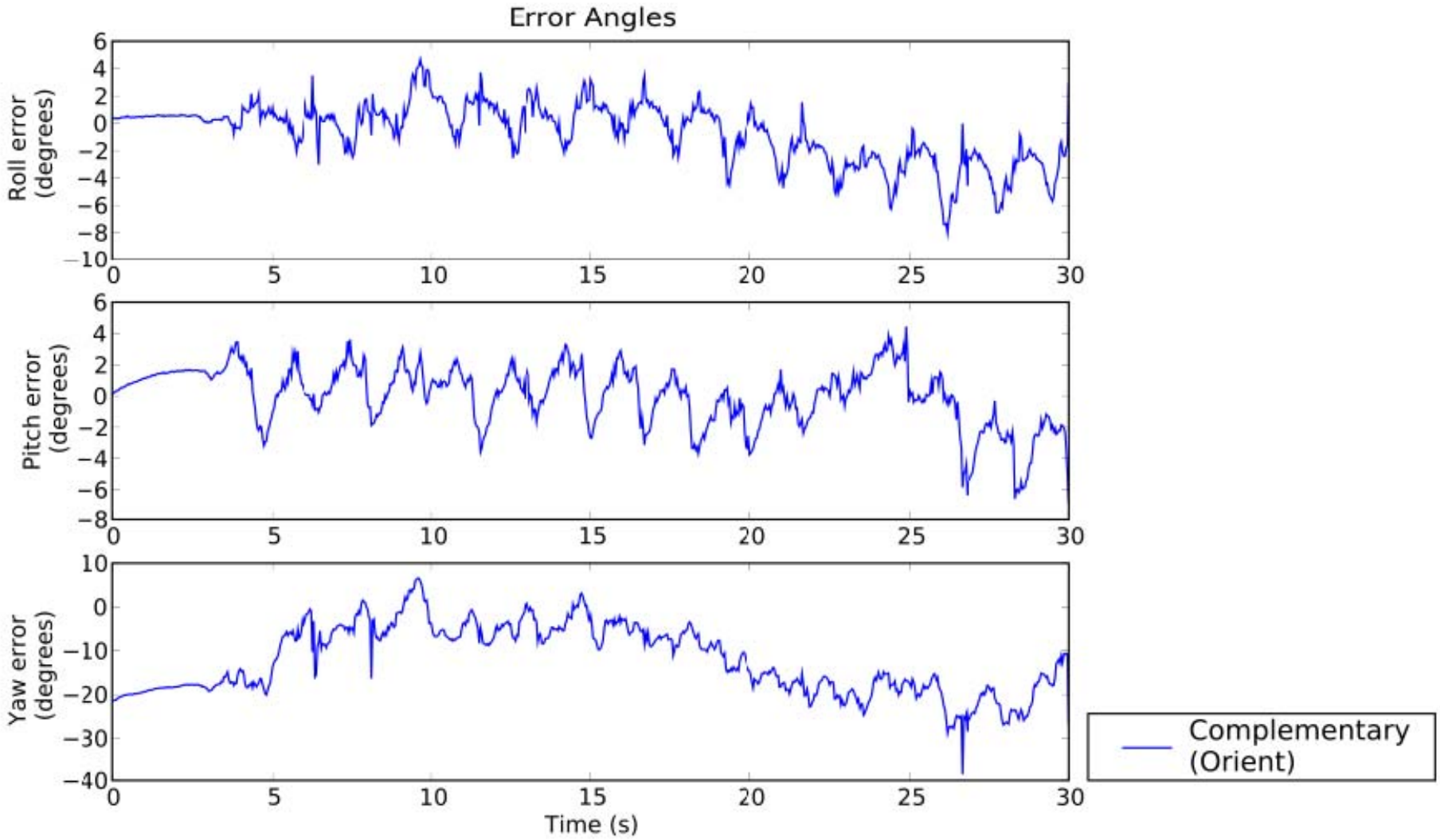
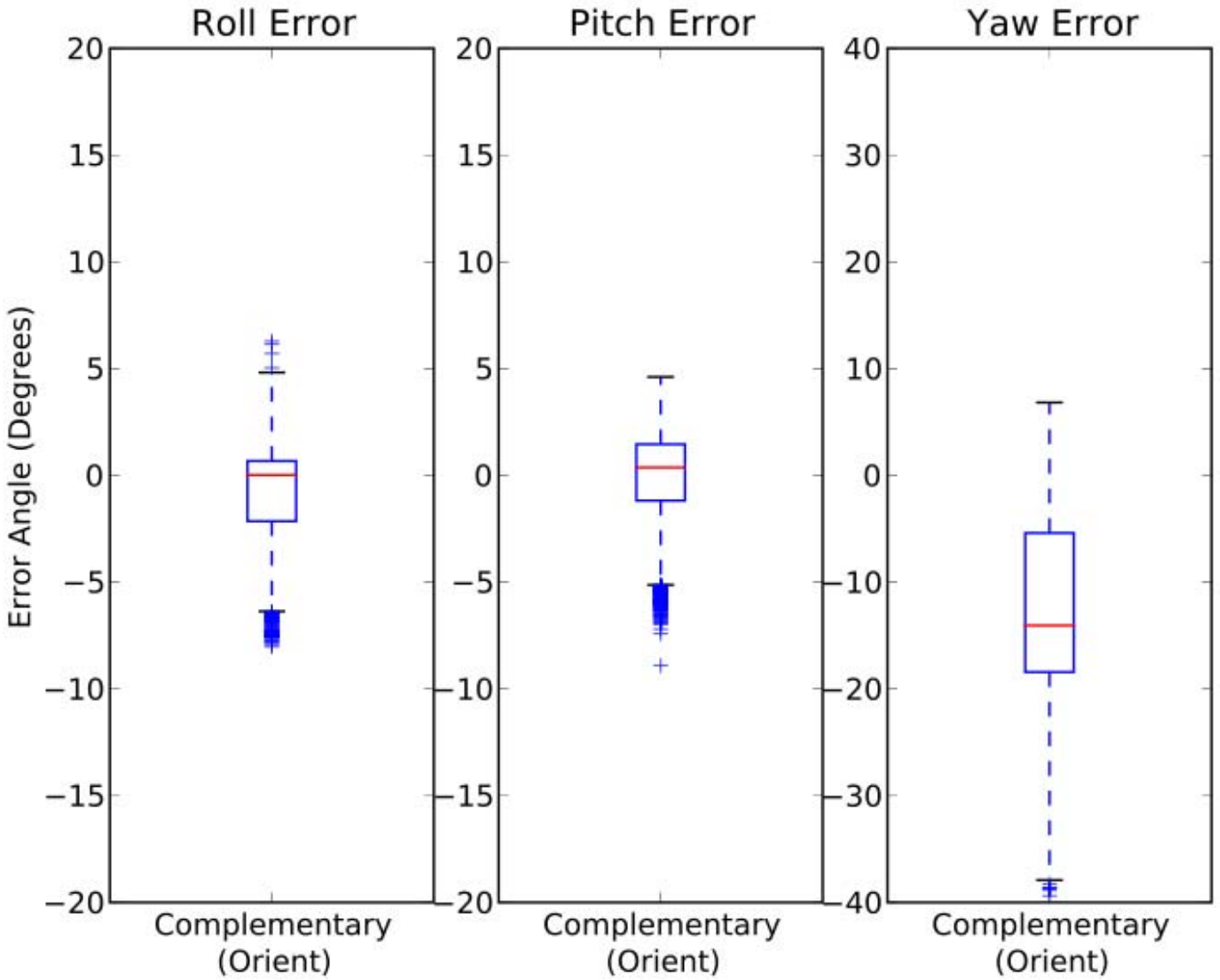
From Earlier…

- Walking experiments in progress
  - Comparison against Qualisys optical motion capture
  - Treadmill used to allow for longer captures

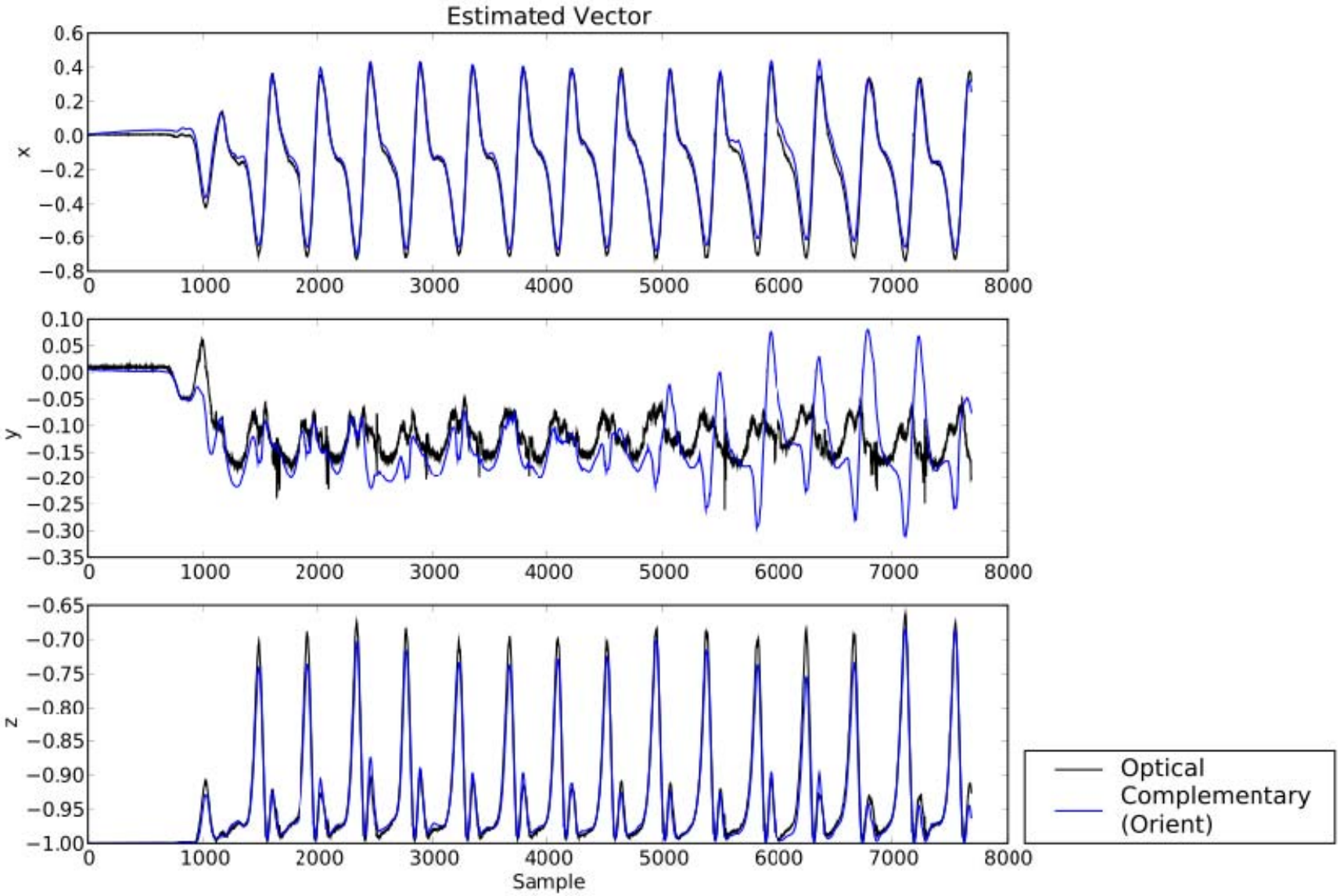
From Earlier...



From Earlier...



Motion Comparison



Discussion

- Pitch & Roll errors reasonable
  - Mean (alignment error) < 1 degree
  - Standard Deviation < 2.5 degrees
- Yaw error much larger
  - Due to magnetic field distortion caused by steel treadmill
  - We can detect distortions – need to investigate correction
- How accurate do we need to be?

Other Challenges

- Alignment of sensors to body segment
  - Existing auto-alignment requires subject to stand in a calibration pose
    - Typically T-stance but can be tailored individually
    - Some subjects may be unable to hold a static pose
  - Manual alignment also possible
    - Requires careful design of straps to facilitate easy alignment

Other Challenges

- Task grouping / Position tracking
  - Real world walking conditions not well controlled
  - We will want to be able to identify different tasks
    - Walking on pavement / grass / gravel
    - Walking on level surface / slope / stairs

Conclusion

- Need to start preliminary trials to answer questions
  - How accurate do we need to be?
  - How do we solve the alignment issue?
  - What knowledge do we need of the environment?
    - Can we infer environmental properties?