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eSleek20

State Estimation

Done

- Try least-squares IMU fusion with motion model → did not work
  - Use mean-based fusion, but test least-squares fusion during PreST
- Add override mode for outlier detection
  - Can be used to manually enable/disable sensors
- Add outlier detection and switching for IMUs
  - Issue with dynamic creation of cell array
- Improve EKF bank
  - works for all SFII, GPS and wheels now
- Change EKF inputs
  - Only SFII and wheels are used for v
  - GPS v is only used in outlier detection

Outlier Detection

Measurement vs. EKF Estimate for Velocity in x [m/s]

Next steps
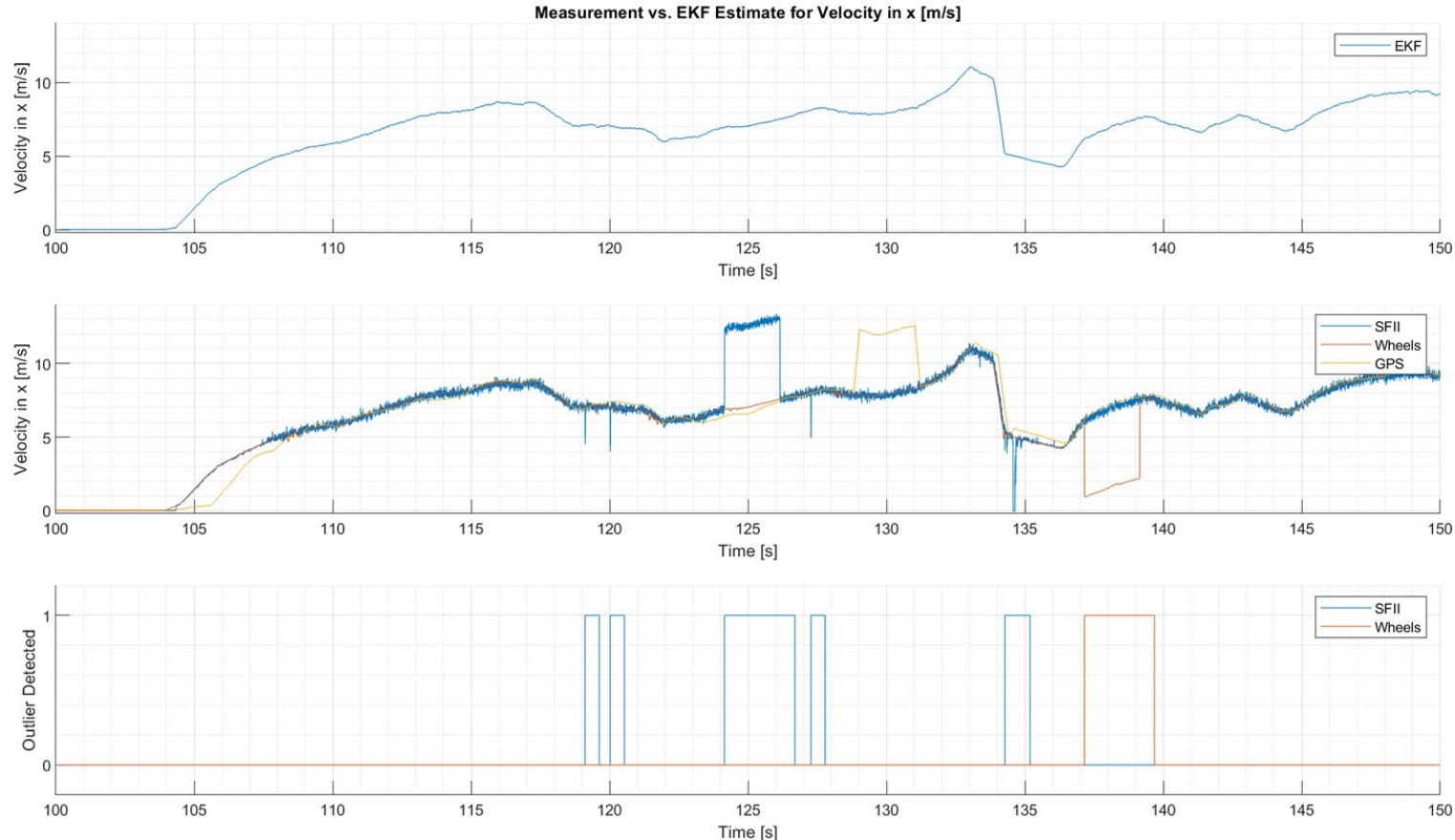
- Improve velocity estimation from wheel speeds
  - Vehicle Speed Estimation Using Accelerometer and Wheel Speed Measurements

    - http://doi.org/10.4271/2002-01-2229

  - Estimation of absolute vehicle speed using fuzzy logic rule-based Kalman filter

    - http://doi.org/10.1109/ACC.1995.532084

Questions

- Wenn kein SFII vorhanden (→ kein v_y), muss Abdriften durch IMUs verhindert werden?
  - vlt. durch Pseudo-Messung von v_y = 0 mit hoher Varianz