Mini-Project 2

Paper Results

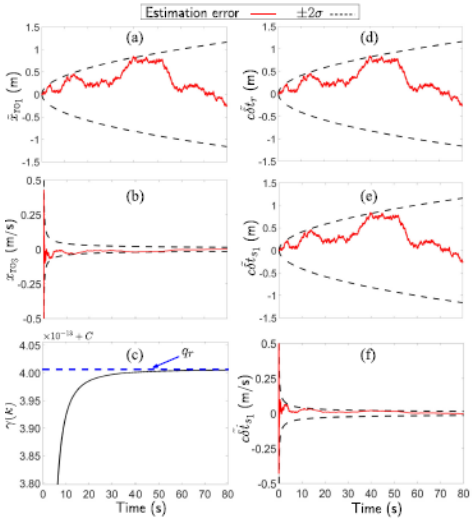


Fig. 1. Estimation error trajectories (red) and corresponding $\pm 2\sigma$ bounds (black dashed). (a) and (b) correspond to a reduced-order KF estimating $\boldsymbol{x}_{\mathrm{ro}}$ using settings from Table II, where $\boldsymbol{x}_{\mathrm{ro}_i} \triangleq \boldsymbol{e}_i^{\mathrm{T}} \boldsymbol{x}_{\mathrm{ro}}$. (c) illustrates the time evolution of $\gamma(k) = \boldsymbol{e}_1^{\mathrm{T}} \left[\mathbf{U}_{\boldsymbol{x}_{\mathrm{clk}},\mathrm{inc}}(k) - \mathbf{U}_{\boldsymbol{x}_{\mathrm{clk}},\mathrm{red}}(k) \right] \boldsymbol{e}_1$ (black) and the value of its limit q_r (blue dotted), where $C = 4.2241493 \times 10^{-5}$. (d)–(f) correspond to the clock errors of the receiver and transmitter 1, which were reconstructed through (5), and their corresponding $\pm 2\sigma$ bounds, which were computed using (7) and (9).

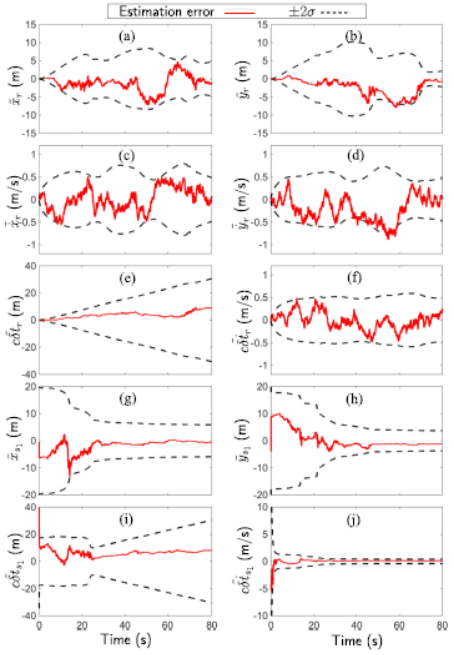


Fig. 3. Estimation error trajectories (red) and corresponding $\pm 2\sigma$ bounds (black) for EKF-based radio SLAM with settings from Table III.

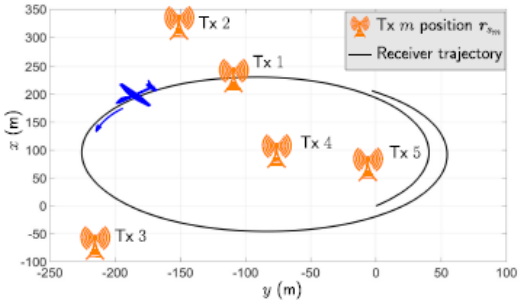
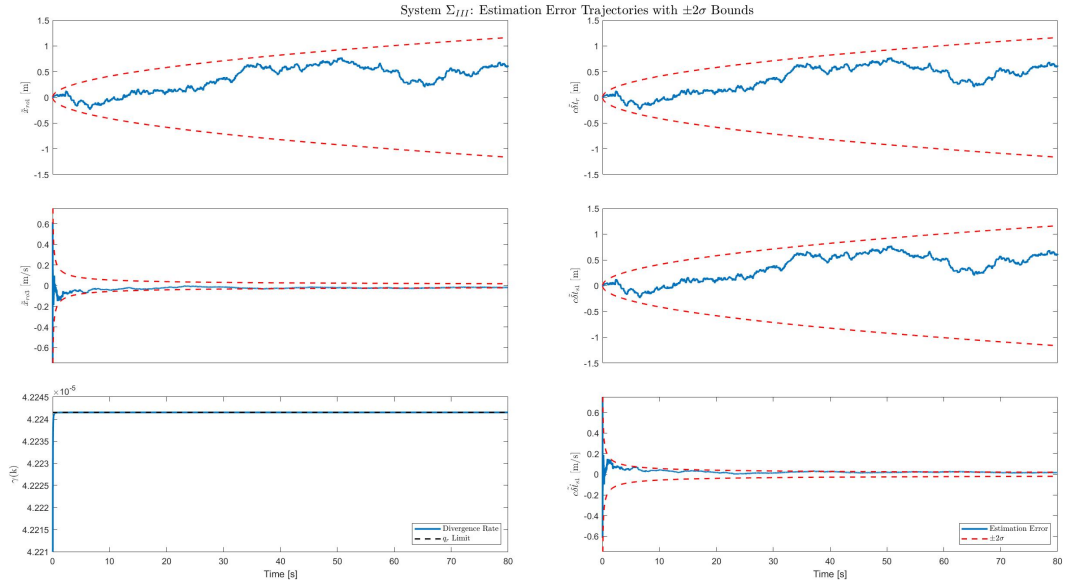


Fig. 2. Simulated environment consisting of $M = 5$ RF transmitters (Tx) (orange) and one UAV-mounted receiver traversing a circular orbit (black).

Replicated Results

System $\Sigma_{\mathbf{III}}$: Reduced-Order System (Kalman Filter)



System Σ: UAV-Mounted Receiver with Five RF Transmitters (EKF)