EE 570: Location and Navigation

Introduction to Navigation

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- The process of determining a vehicle's "course" by geometry, astronomy, radio signal, or other means.
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  - Dead Reckoning: measures changes in position and/or attitude
    - need to initialized and then "integrate" the Δ's
    - Inertial sensors measure the Δ's without requiring an external reference

Dead Reckoning: An Example 1

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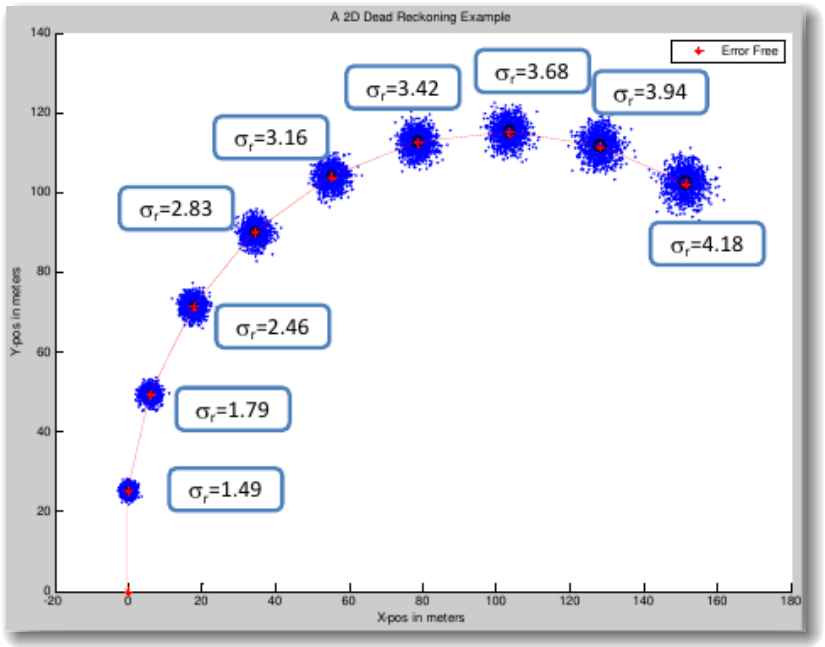

Dead Reckoning: UGV Examples

PVA needed in terms of local datum

DARPA grand challenge

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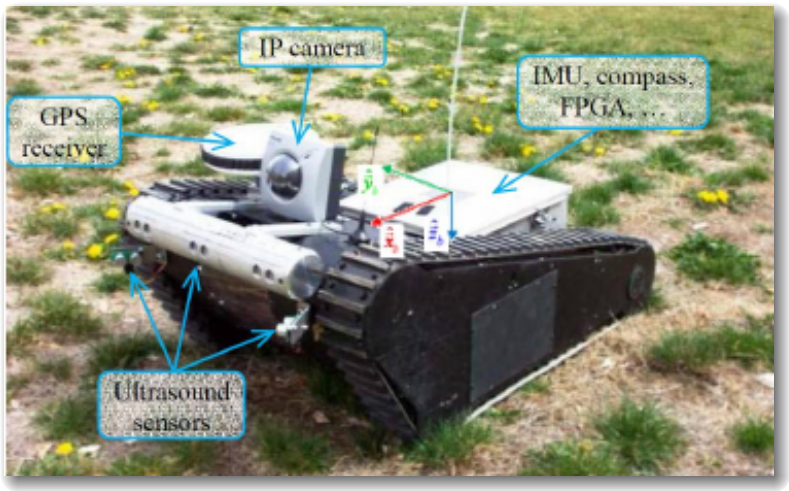
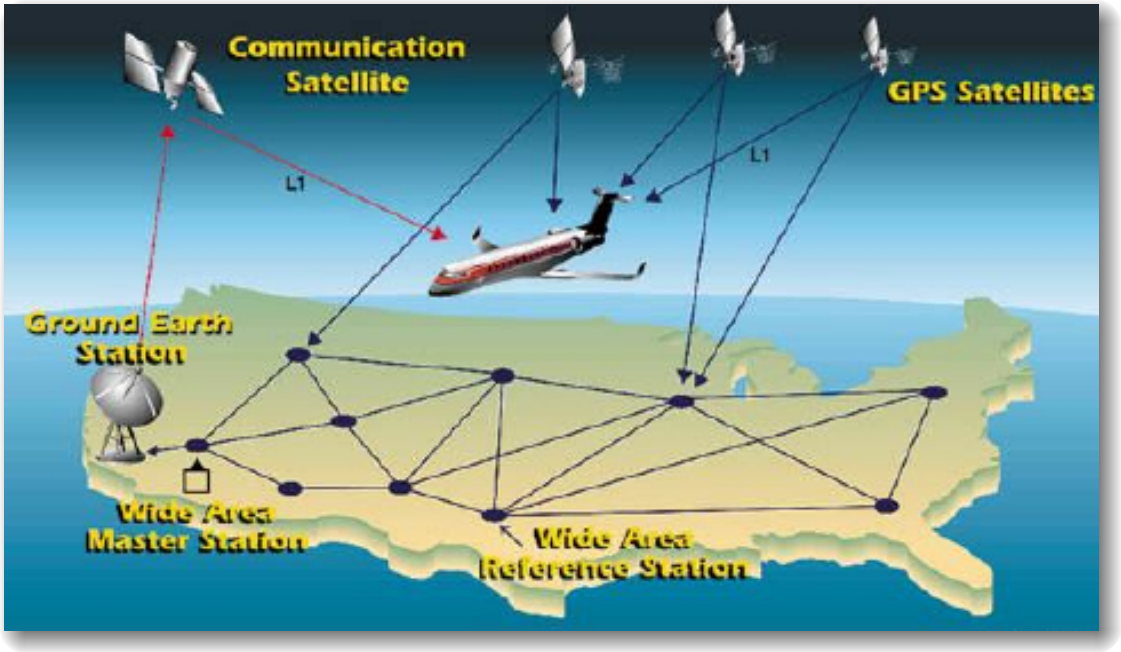
SOCOM Robot (EE NMT project)



Dead Reckoning: Aircraft or UAV Examples

Earth Centered Earth Fixed Coordinate System



Earth Centered Inertial Coordinate System

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     - attitude can be a bit tricky!!
3. When answering the question "where am I?" the *wrt* must be very clearly defined!!
   - Lead in to the notion of coordinate systems

Navigation Sensors: Past, Current, and Future