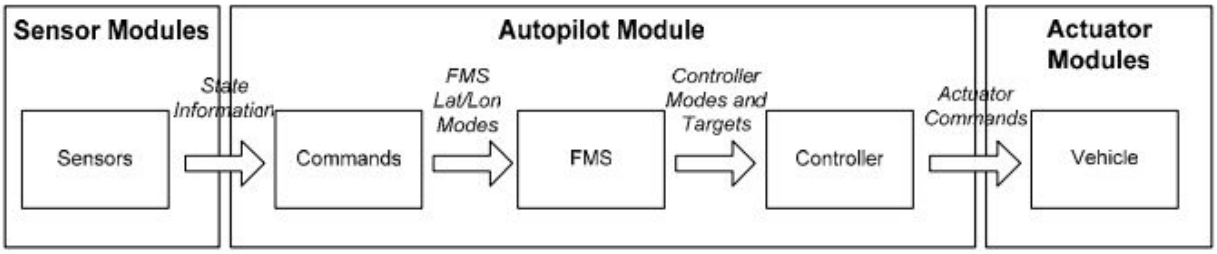
HITL



Conceptual Data Flow and Components

The basic components required for simulation framework:

1. A structural dynamics model that outputs airframe deformation.
    a. Inputs: Forces and moments acting on the structure
    b. Outputs: Velocities and accelerations
2. Aerodynamic model
    a. Function of the flight conditions
    b. Rigid-body attitudes
3. EoM block
    a. Total forces and moments acting on the aircraft
    b. Aircraft mass properties.
4. A gravity model to compute the gravitational forces acting on the aircraft.
5. Control surface and flight control systems to simulate controlled flight

Test conditions:

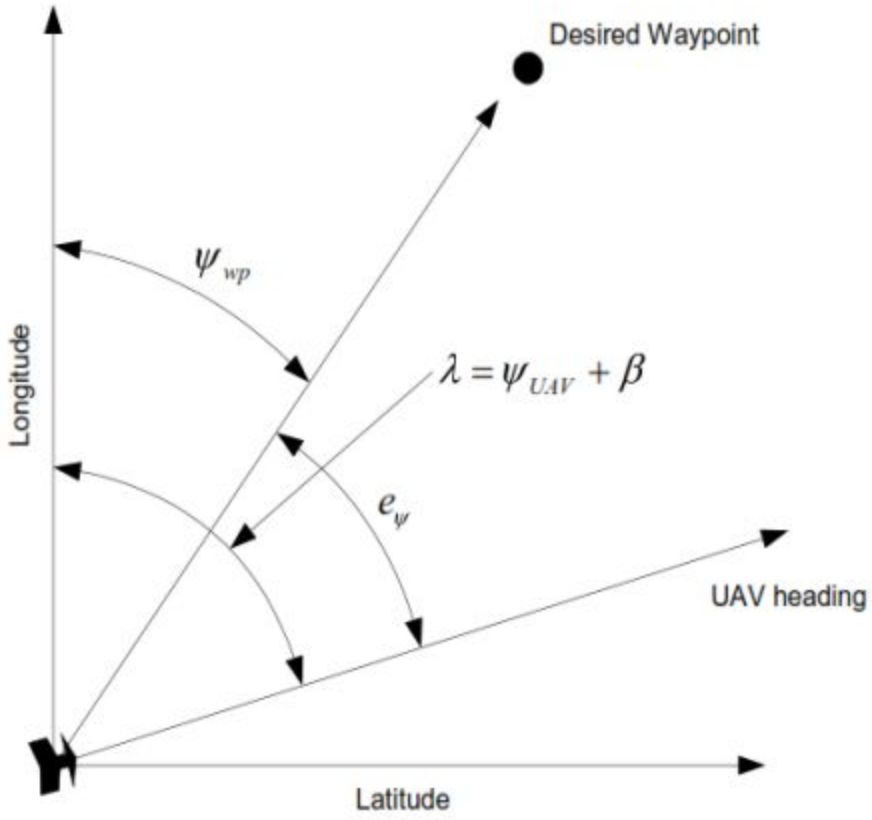
1. Parameters tests to assure that the model is free of principle errors.
2. Unit tests assess the functionality of an individual software component.
3. Simulation provides the infrastructure for operational system integration.
4. Flight tests provide a practical proof of concept for validate run-time and
5. hardware thresholds.

Equations need to be defined:

1. Body-axes force
2. Moments
3. Kinematics
4. Navigations

Inner loop control:

- Lateral Controller, Longitudinal Controller, Altitude Controller
- Roll Rate Controller, Pitch Rate Controller
- Angle Controller, Heading Controller
- Speed Controller, Navigation Controller



waypoint tracking angle