

Learn-To-Fly (L2F)

National Aeronautics and
Space Administration



Real-Time Modeling, Learning Control, and Guidance for Autonomous Flight

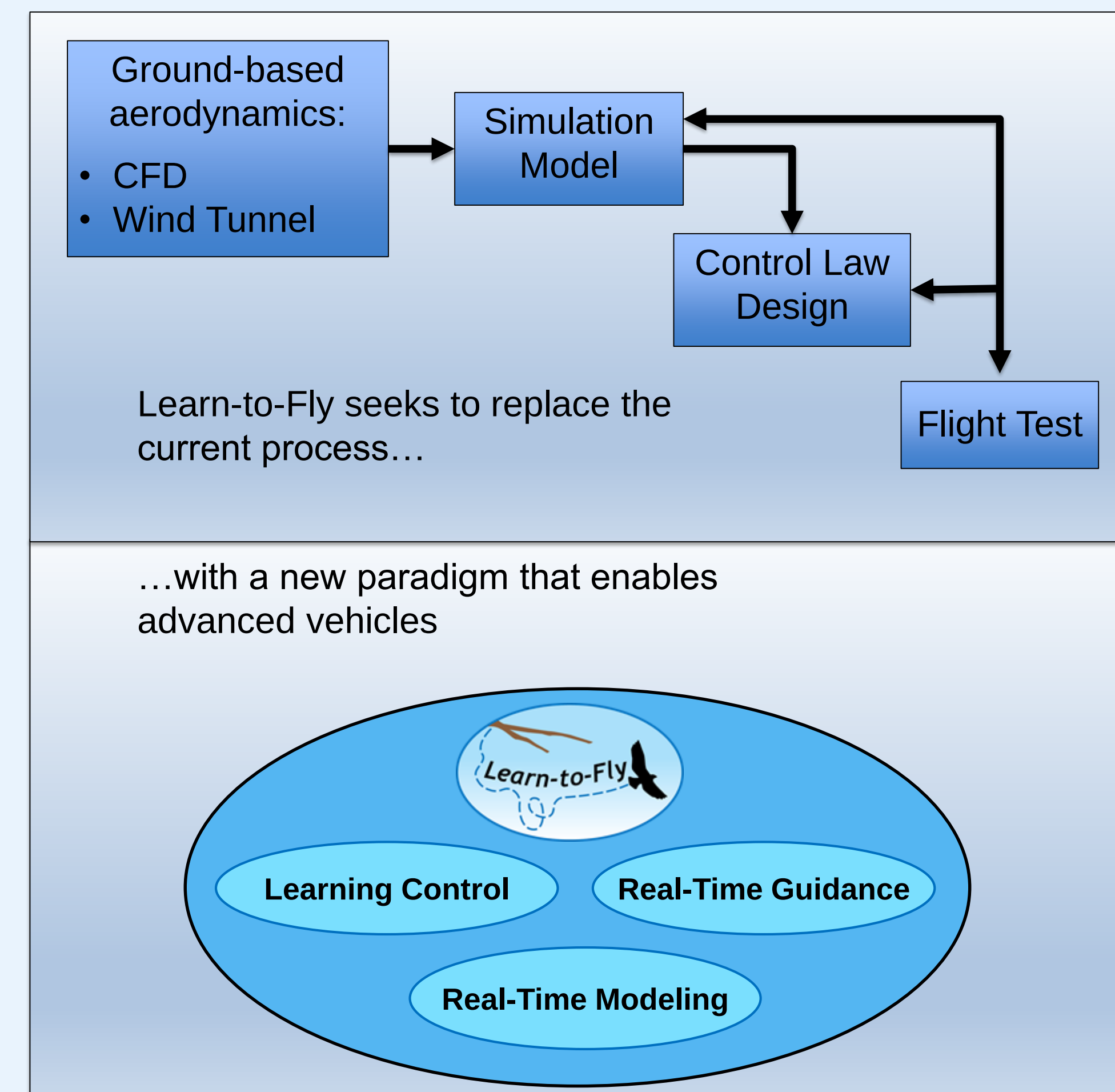
Overview

Learn-To-Fly merges real-time modeling, learning adaptive control, and real-time guidance to achieve:

- Autonomous self-learning aircraft to **disrupt our current vehicle development paradigm**
- Novel configuration development with no ground testing
- Robust autonomous flight of novel aircraft

Applications

- Rapid aircraft prototyping
- Rapid simulation and control law development
- Efficient developmental flight testing
- Robust operation of UAS in the NAS
- Aircraft safety and robustness to failures



Learn-To-Fly Concept

Partners

- Langley Research Center (LaRC)
- Ames Research Center (ARC)
- Armstrong Flight Research Center (AFRC)
- University of Illinois Urbana-Champaign (UIUC)

Recent Results

- Real-time global modeling demonstrated on E1 in flight
- Real-time Guidance demonstrated in flight on E1 in flight
- Real-time adaptive Control demonstrated on E1 in flight
- Learn-To-Fly algorithm demonstrated on E1 in flight



Initial Autonomous
Learn-To-Fly Flight Test



E1 Electric Powered Aircraft



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