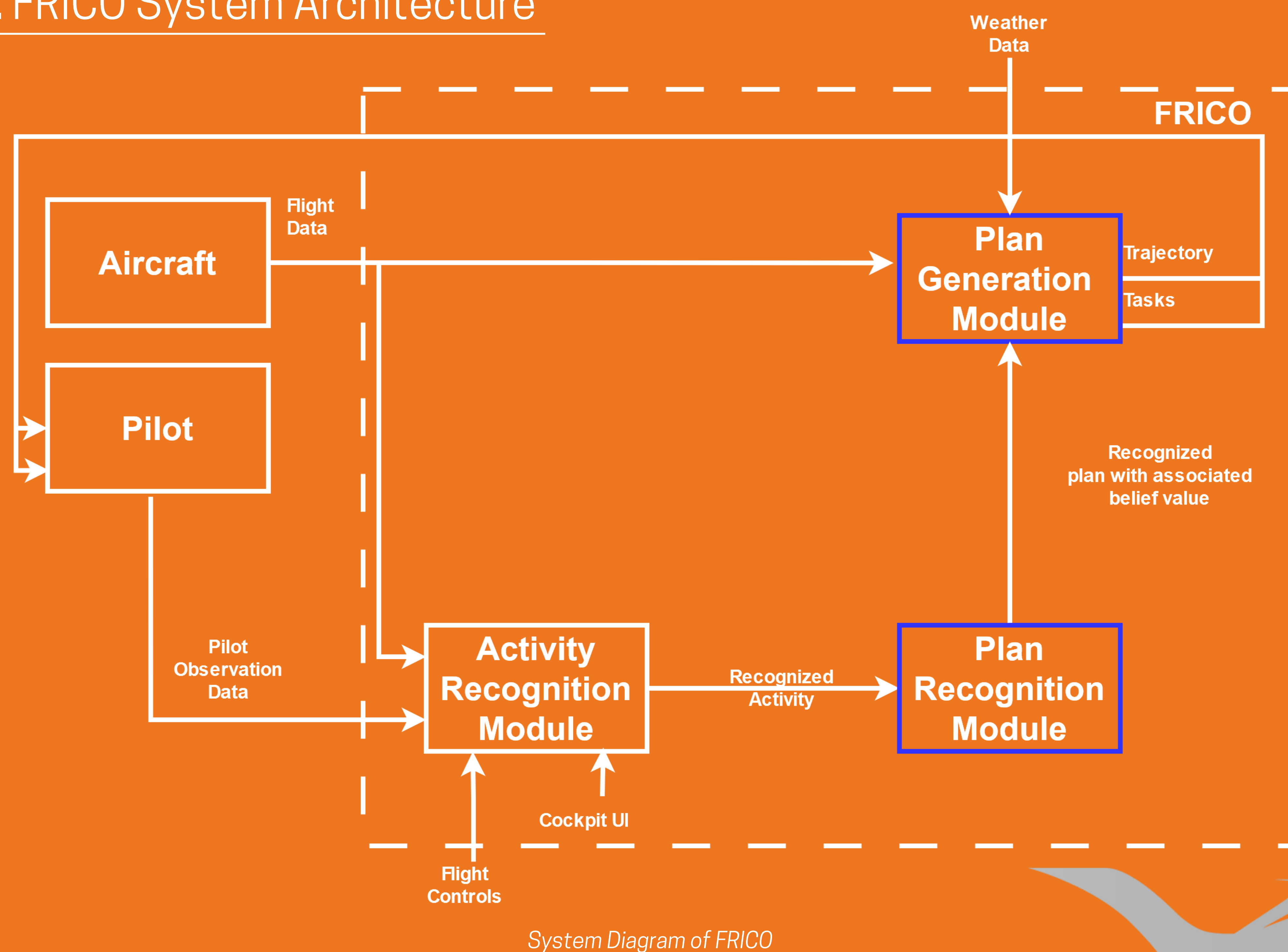


FRICO : An AI-Enabled FRIendly COckpit Assistance System

01 MOTIVATION

- **Human-factor** induced accidents occur more frequently in general aviation.
- Considering the trend towards **Single Pilot Operation (SPO)** in aviation, assistance systems of the future should be able to provide contextual help to reduce accidents.
- FRICO uses tools from **Automated Planning** like **Numeric Planners**, **Hierarchical Task Network (HTN)**, and **Plan Recognition as Planning**, to make SPOs safer.

02 FRICO System Architecture

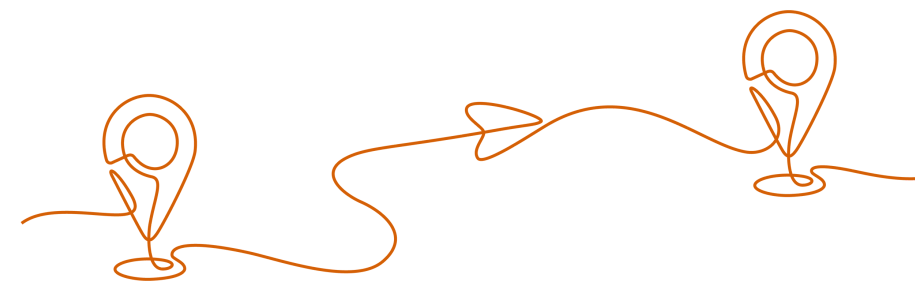


Plan Generation Module

Provides flight guidance using automated planning.

Flight Path

- The flight path plan is generated using **Expressive Numeric Heuristic Planner (ENHSP)**.
- The flight model is encoded in the domain File using PDDL+ and the airplane state and the weather data are encoded in the problem file.



Cockpit Tasks

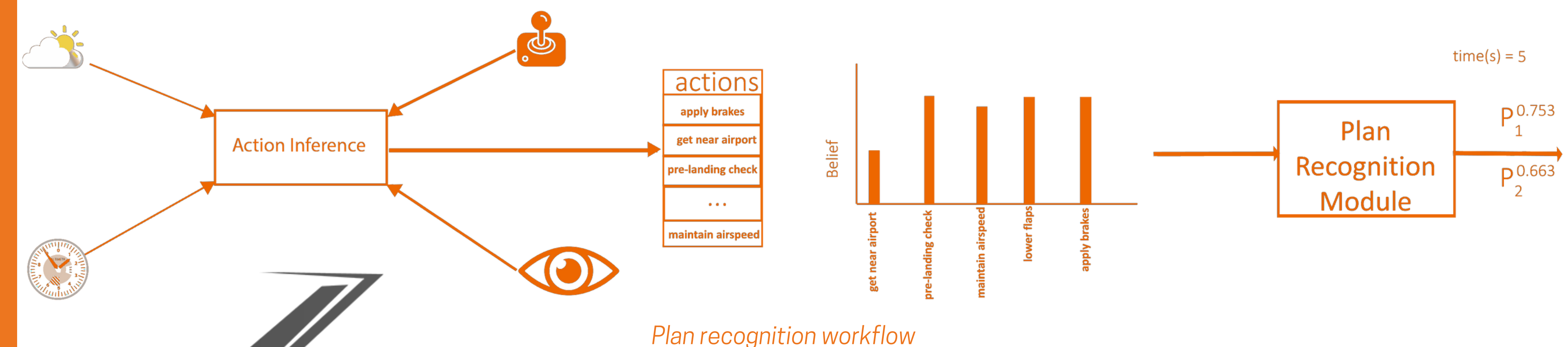
- The **PANDA framework** is used to generate instructions to perform typical tasks, using embedded domain knowledge.



Plan Recognition Module

Makes the flight guidance **contextual**, tailored to the pilot's need in real-time. The system :

- combines various sensor data to make **action inference**.
- makes inferences about the pilot's intention (i.e. intended plan), from the sequence of observed actions.
- is implemented using hierarchical plan recognition as planning from the PANDA framework.



Plan recognition workflow

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Related Literature

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