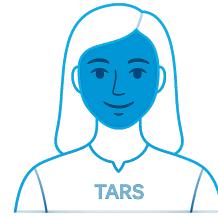
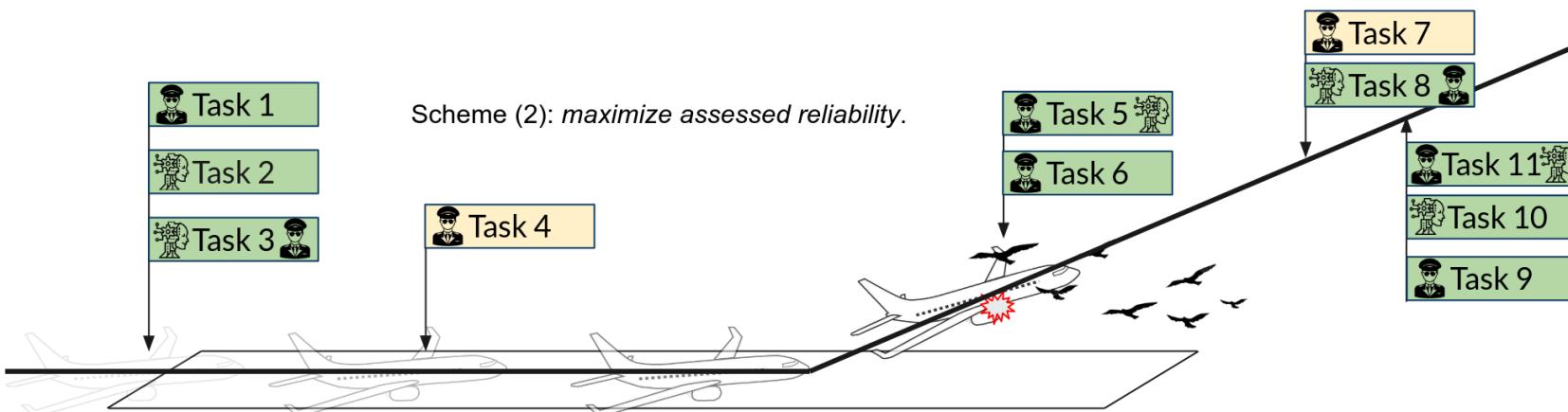

ADAIR - FLIGHT DECK - TARS AUTONOMOUS SUPPORT FOR SPO

Demo • Autonomy/Automation • Shared Interface • Winter Experiments • Cognitive model validation



Today's Plan

- Live demo: takeoff → bird strike → engine failure → checklist resolution
- TARS algorithm
- Shared interface
- Winter pilot-in-the-loop study for cognitive model validation

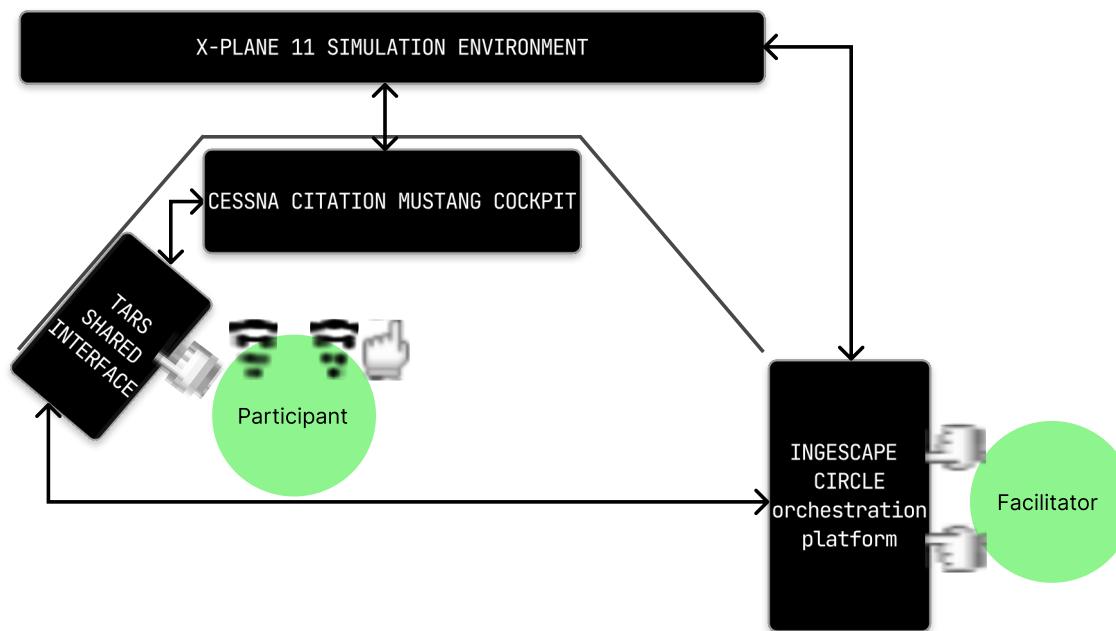


SCENARIO DEMO

I will act both as the PILOT and the FACILITATOR

What to Watch

- TARS alerts + recommendations
- Pilot actions with TARS in NORMAL and ABNORMAL situation
- Shared interface Aural/Visual cues
- Facilitator control platform (ingescape)



TARS PROTOTYPE

How it relates to Interdependence Analysis ?

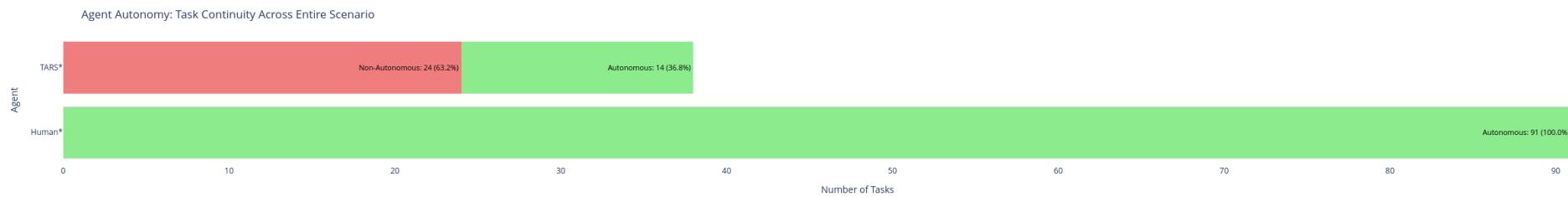
TARS Functions

- Propose procedure sequence as agreed in Briefing
- Display scenario progression at task and procedure level along with allocation
- Integrates an Electronic Checklist
- Perform and support as agreed in Briefing

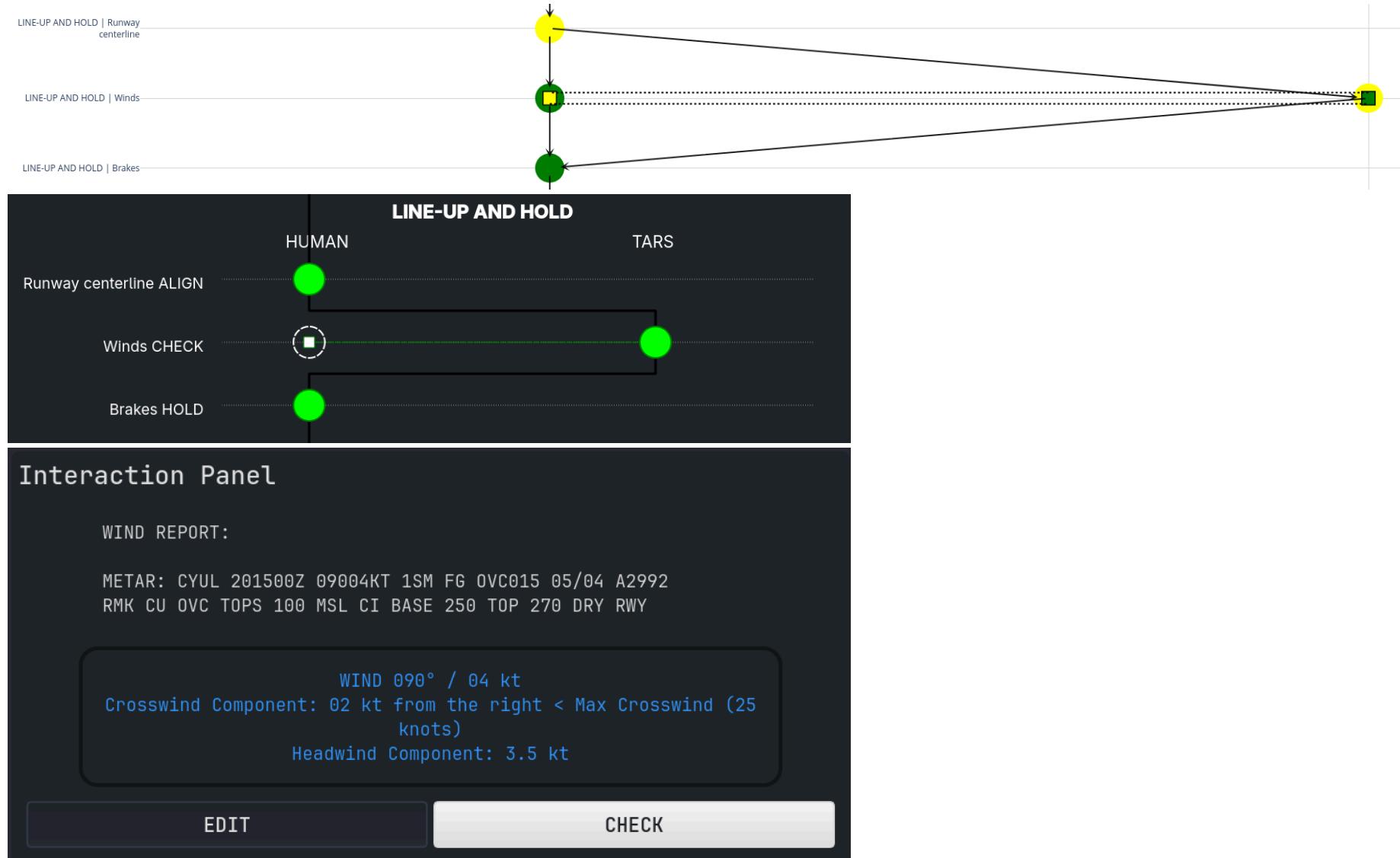
TARS Autonomy



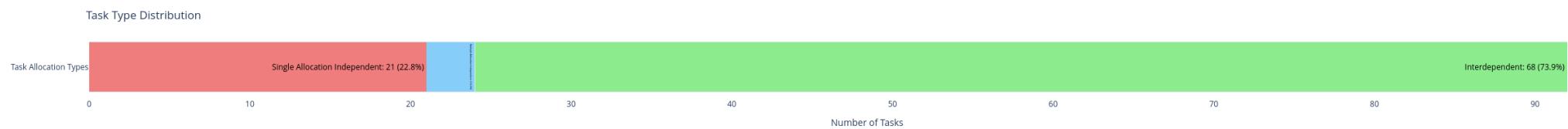
TARS Autonomy



TARS Interdependence



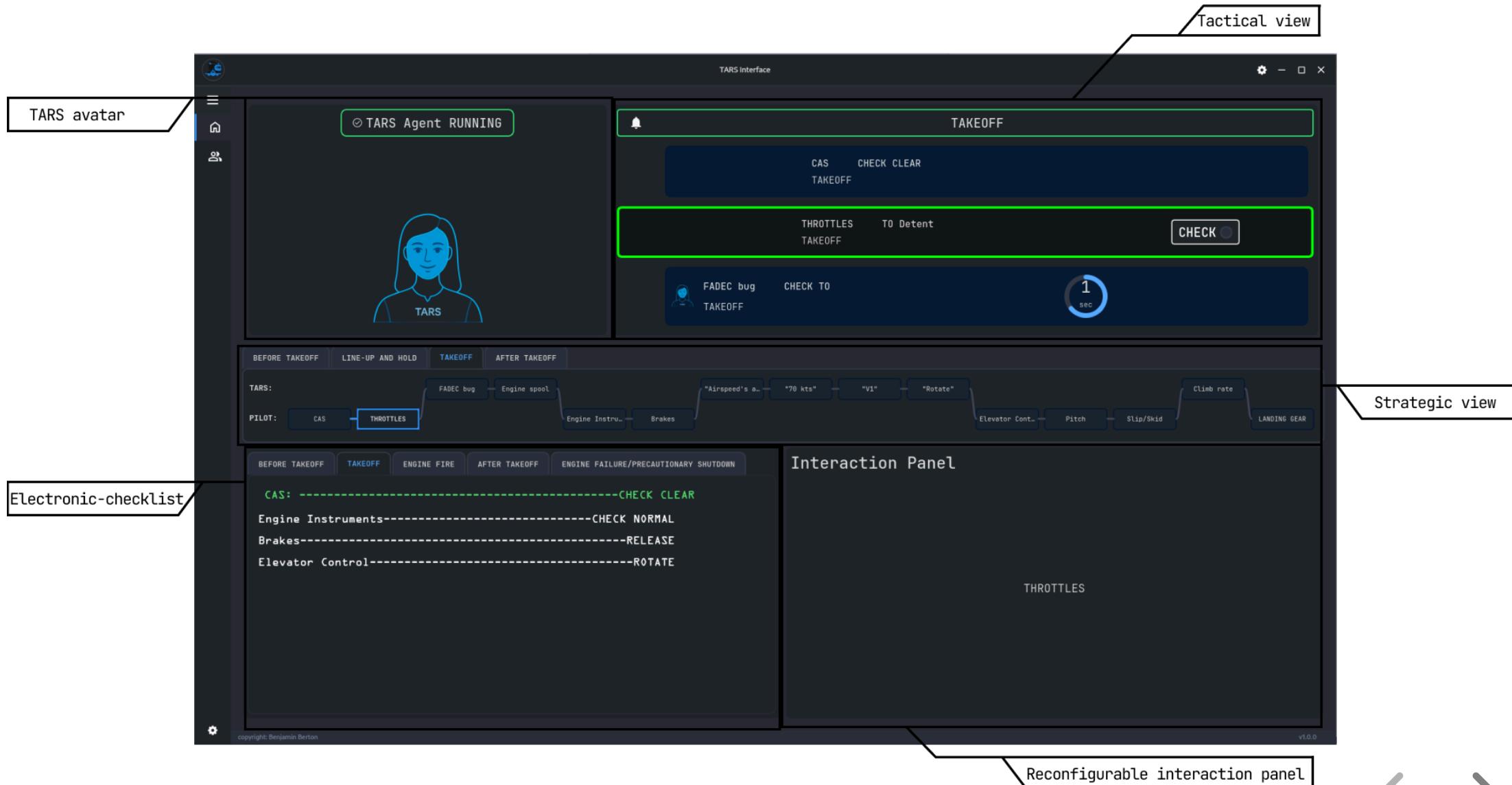
TARS Interdependence



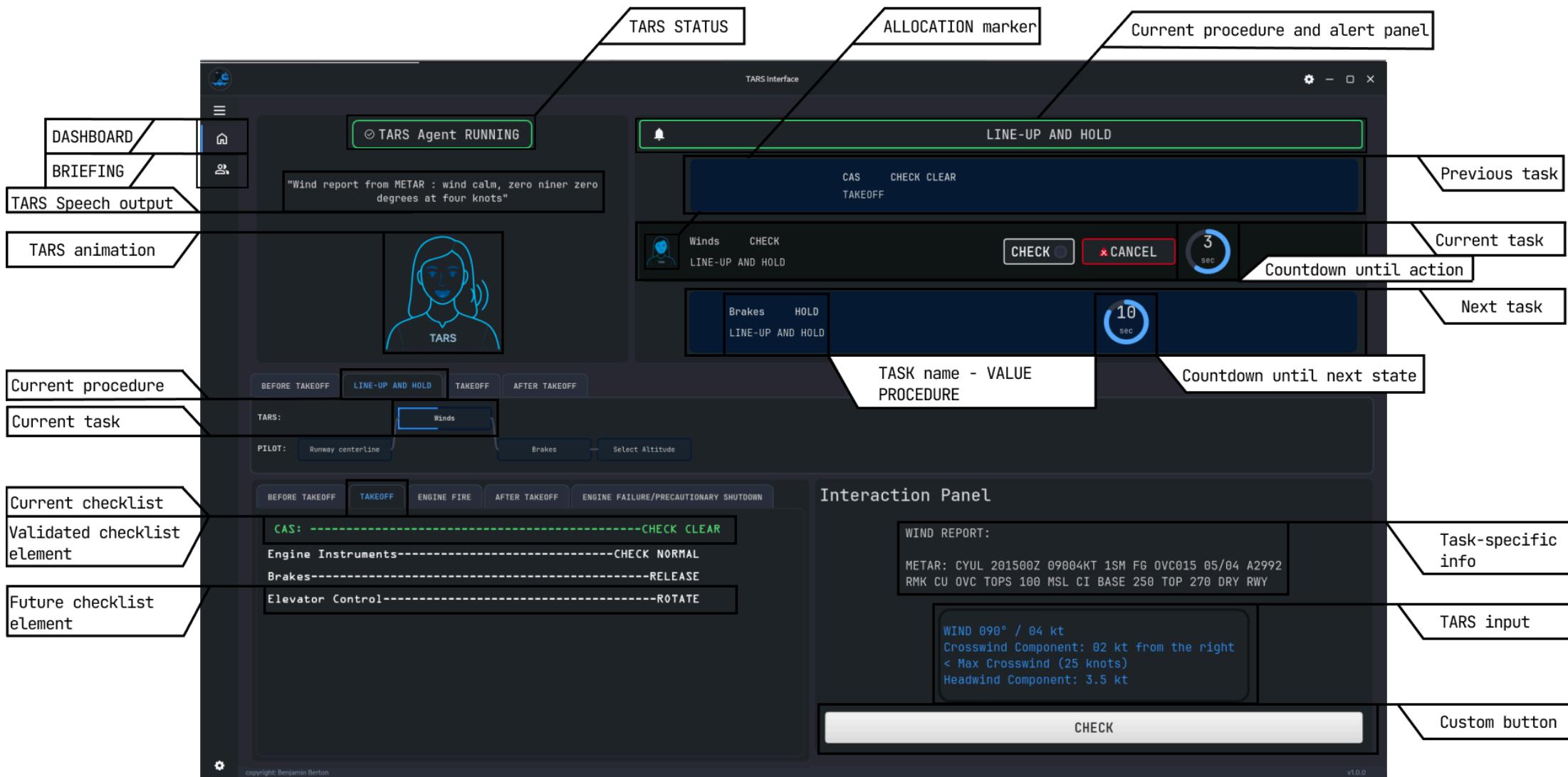
SHARED INTERFACE

And how it relates to Interdependence Analysis

Interface anatomy

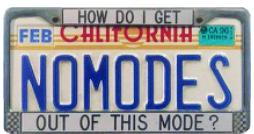


Interface anatomy



How does Observability, Predictability and Directability requirements are generally embodied in the shared interface

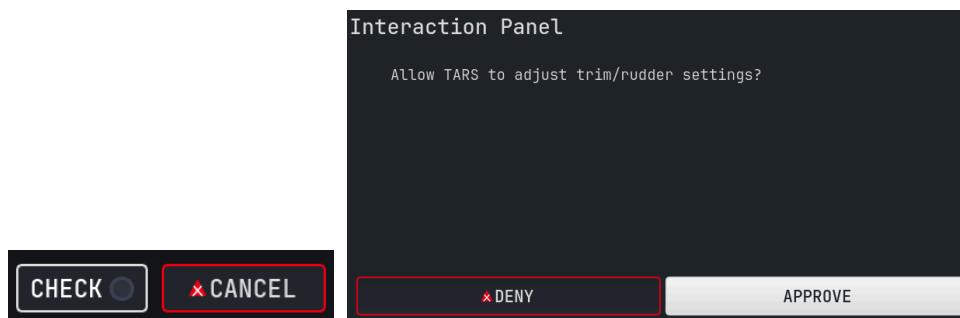
- Observability: Usually about externalizing current state and rationale for action/suggestions, and no modes approach



- Predictability: Algorithm consistency, visible timing for state switching, callouts (CRM), multiple projected views



- Directability: Mixed-initiative, never-mandatory always overridable safety-net approach, both vocally and touch input, ladder of abstraction

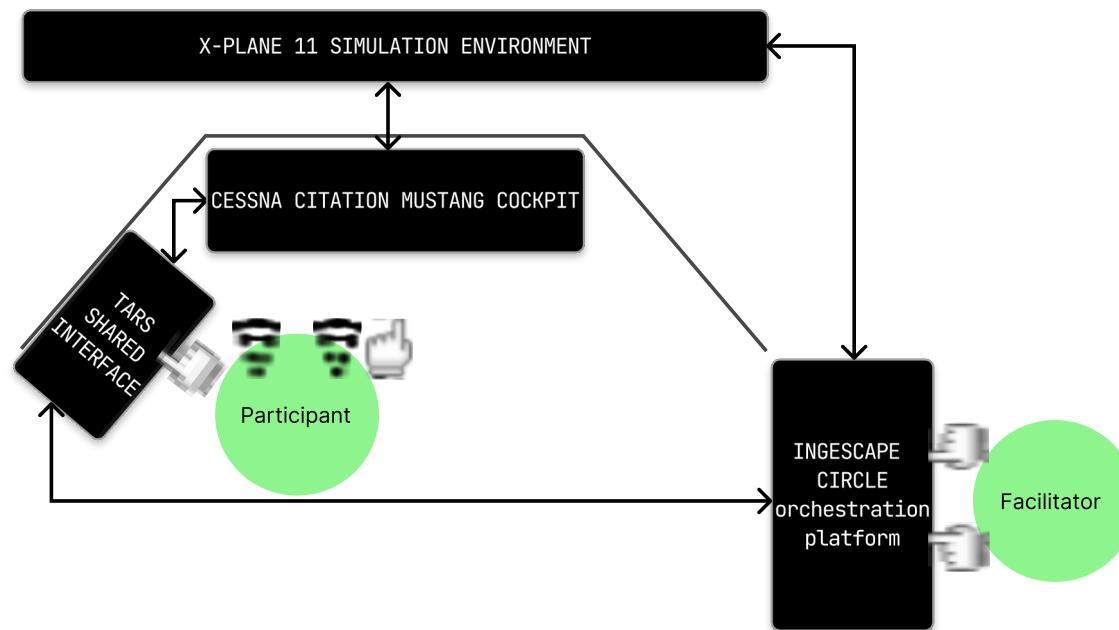


WINTER EXPERIMENTS



Study Design

- 4 Conditions: NO TARS; TARS full; TARS min; TARS custom
- Minimum 8 pilots for latin-square. CPL + IR (ME? MCC?)
- DV:
- Eye-tracking (AoI dwell times) + NASA-TLX + Behavior & performance, TARS customization



Model Validation

- Compare predicted vs empirical date using Root-Mean-Square Error, Mean Absolute Percentage Error, (I need to research more on Pearson correlation, Spearman's rho and Concordance Correlation Coefficient)
- Perform model tracing for custom

