KITESWARMS

Applying TOPCORE

Modular data acquisition for flight control

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Introduction and Motivation

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- ERC HIGHWIND Research grant
- Rotational start-up and landing of a tethered airplane
- Need for rapid control prototyping and reconfiguration
- Complete toolchain for hardware developers and control engineers
- Flexibility: “Single point of success”

Hardware Goal

Give the full control authority to the control engineer!

TOPCORE Recapitulation

General thoughts

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Three core principles for the system design:

Modularity

Clear-cut components that can be extended or exchanged.

Clean interfaces

Allow the user to create components or replace existing ones.

Tools

Example implementations and utilities.

TOPCORE Recapitulation

Exchangeable components

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The platform is separated into three logical function blocks:

I. Dedicated computing component
   - Separating computing power from low-level hardware
   - Performance improvements can easily be facilitated by replacing this components hardware

II. Embedded low-level component
   - Fuse all data into a continuous single point data stream
   - Distribute control input in the system
   - Can be exchanged with a minimalistic version for production

III. Endpoints
   - Function as a connection to the outside world
   - Can be moved, added or upgraded inside the experiment
   - Reusable and cheap

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Conclusion

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- Easy component updates
- Rapid proto-typing
- Fast implementation with field-tested subcircuits

Thank you for your attention!

Time for questions, **criticism** (don't spare me) and feedback