Service-Oriented Systems & Self-Adaptive Software
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Challenge

Self-Adaptive Service-oriented Software equals open, evolving systems of systems.

How can we enable trustworthy self-adaptation and evolution for Service-oriented Systems?

Some open issues:

- How to meaningful control at runtime the self-adaptation of choreographies and orchestrations?
- How to exclude unwanted co-adaptation races or other anomalies in open service-oriented systems?
A **trustworthy** choreography for a convoy of shuttles:

- Adaptation capabilities are captured by role contracts
- Convoy choreography requires good knowledge about subsystems
- Choreography protocol is designed/verified completely upfront

**Missing:** full heterogeneity, openness, evolution of the protocol, ...

Other cases: competing at switches, compete for passengers, ...
A trustworthy choreography for self-optimization:

- Distributed learning of a model of the track (context)
- Local learning of a model of the shuttle (self!)
- Planning an adaptation in form of an optimal trajectory
- **Trajectory synthesis & backup establishes assurance**

**Missing:** full heterogeneity, competing scheme, ...
FINE
A **trustworthy** orchestration of subordinated OCMs:

- Supervising OCM coordinate offered adaptation contracts of subordinated OCMs
- Supervising OCM sets goals for subordinated OCMs that locally adapt accordingly
- Orchestration behavior is designed/verified completely upfront

**Missing:** openness?, upward goal propagation, ...