



RoSym Workshop

1st international workshop on MDE for robotics

L. Rioux



What is a hyper-complex system ?

An embedded systems

- ▶ Very limited resources.
 - Energy, sensors, actuators, computation, size, weight...
- ▶ Operate in real-time and with fault tolerance

Got a very complex software

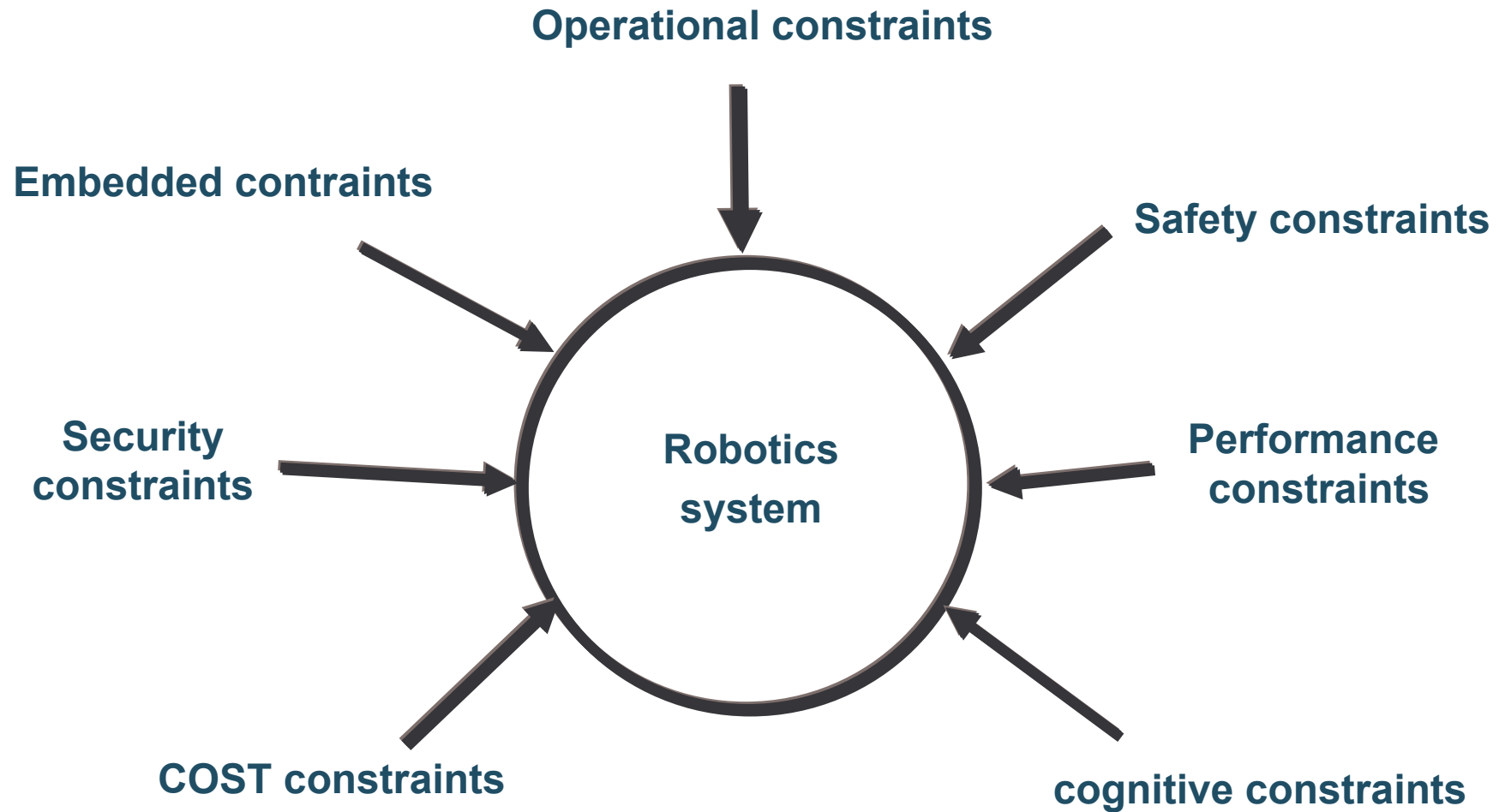
- ▶ Pilot/supervision functions replaced by software
 - And it is not the most easier function.
- ▶ Cognitive Software

Run Safely: because operate in the human world and with human

- ▶ Do not be dangerous for its environment and itself
- ▶ Meet safety requirements and procedure to operate

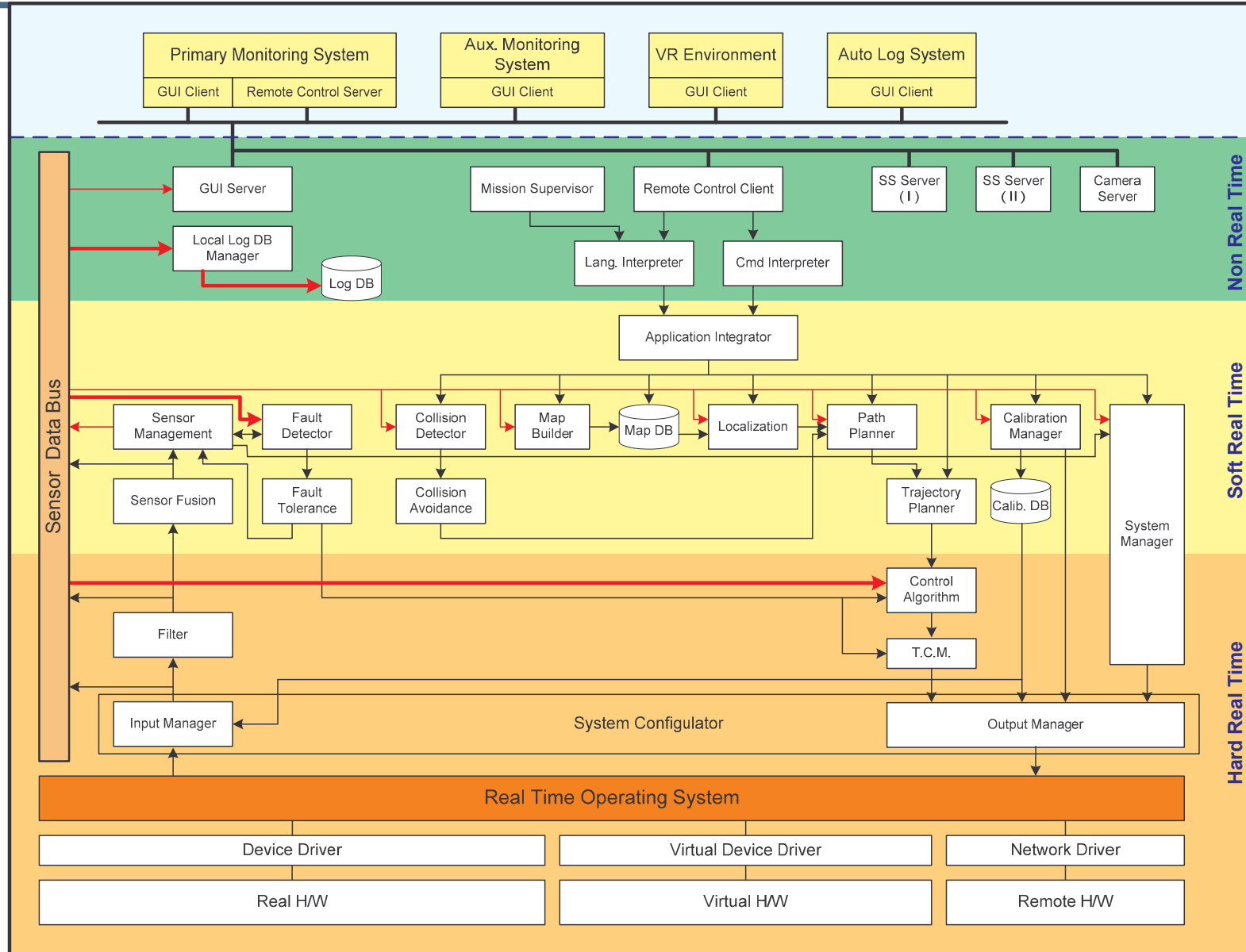
Cost effective design

- ▶ Robot may have to be cheaper than no-robot system.
- ▶ Possibility to buy many of them (e.g for collaborative work)



Need to satisfy all these constraints

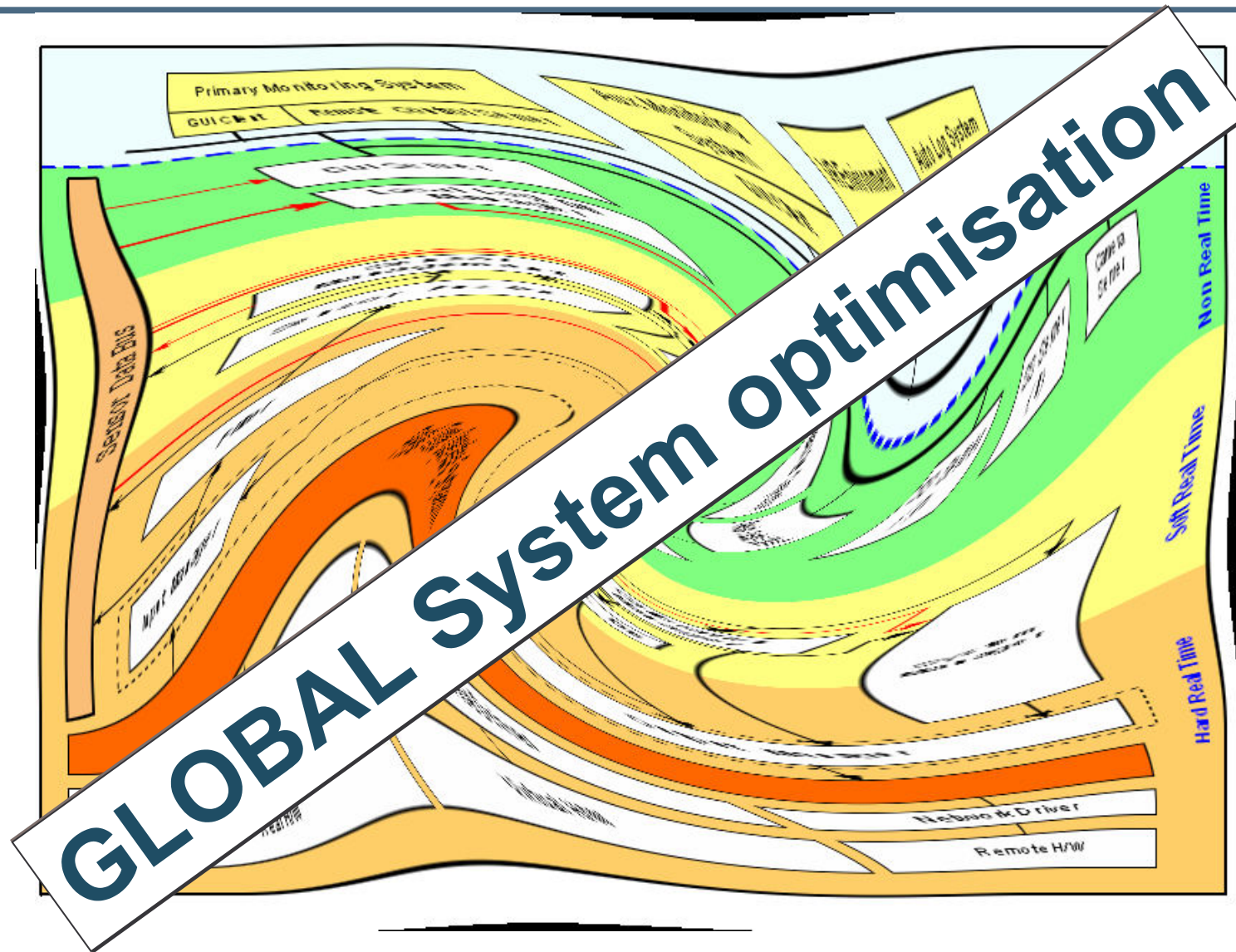
How to implement/realize this kind of system ?



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How to optimise robotics architecture requirements ?

How to implement/realize this kind of system ?



MDE as already work for complex system, it will may work for robotics system



MDE has already proven to work for complex systems.

MDE should work for robotics systems

- ▶ Today, MDE is not able to face to all challenges for robotics
- ▶ Still missing a lot of technics/concepts for designing and optimising robotics systems with MDE.



09: 00 - Introduction (L. Rioux, THALES)

09: 10 - Session 1: Designing Robotics systems, *chair (L. Rioux, THALES)*

9:10 : Model-based design of Intelligent Mobile Robot, *Takahiro TAKASU*

9:40 : Model Driven Embedded Systems Design Environment for the Service Robotics Domain, *Martijn Rooker*

10:10 : discussions

10:30 Break

**11:00 – Session 2: « New design approach for robotics software »
*chair (D. Brugali, University of Bergamo)***

11:00: Using Models@Runtime for Designing Adaptive Robotics Software
Juan F. Inglés-Romero, Cristina Vicente-Chicote, Brice Morin and Barais Olivier

11:30 : Integrating Ontological Domain Knowledge into a Robotic DSL
Gaelle Lortal and Saadia Dhouib

12:00 : Discussions

12 :30 Lunch



14:00 Session 3: R&D Projects Session, chair (S. Gerard, CEA-LIST)

14:00 – BRICS Project (D. Brugali, University of Bergamo)

14:30 – PROTEUS Project (L. Rioux, Thales)

15:00 – discussions (or other project presentation)

15:30 Break

16:00 Session 4: MDE : Is a key solution for robotics engineering ?

Discussions session

17:00 End of the workshop