

# OROCOS

Developing, using & maintaining a robotics software framework: lessons learnt and design drivers

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# About me & our company

- Founder of Intermodalics (2011)
  - Robots, Software and Applications
  - Autonomous - 3D vision systems - Drone Fleets
- Employ top-profiles in Robotics Software
  - Consulting and Project solutions in robotics software
  - >50% serving USA
- Only slept 4 hours last night
  - Won't be a selling point today

# Open RObot COntrol Software

- One of the first Open Source Frameworks for Robotics (2001-2005-2011) in C++
- Today part of the ROS and ROCK ecosystems
- Focus on hard real-time applications
  - Curse and a Blessing (*this presentation*)
- Used at ESA, NASA (Goddard, Johnson)

# Data Representation Independence

- PRO
  - Good interoperability with other frameworks
    - ROS, CORBA, ZeroMQ, Boost-C++,...
- CON
  - Hard to exchange data among users
    - People need a 'de facto' standard, even if it's a mediocre one.

# Real-Time Code execution

- PRO
  - Use all features in real-time loop
    - Parameters, data ports, operations, scripts
  - Our main selling point - DETERMINISM
    - Component model and code execution !
- CON
  - API and component model are not *light*

# Mandatory Component Life Cycle

- PRO
  - State machines manage our application's components lifecycle
  - We can't imagine an application without
    - Sorry ROS guys !
- CON
  - Extra barrier to entry, but the return is enormous !

# Standard Primitives

- PRO
  - A universal language all frameworks understand - fosters interoperability
    - Parameters, Function calls, Ports
- CON
  - Can we ever get them perfect ?
    - NO. Live with it.

# Real-Time Scripting

- PRO
  - Flexibility with reliability
    - It's a selling point we constantly under-estimate
  - Forced us to go all the way for introspection
    - Any 3rd party software can interoperate
- CON
  - Compilation times !
    - 3x - 5x larger code size because of introspection

Portability

Just support Linux

(and Mac OS-X)

(and your RTOS)

Thank you.

Everything will be OK in the end,  
and if it's not OK, it's not the end.