Flanders’ MECHATRONICS Technology Centre & xenomai

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Mission of FMTC

Jointly develop new and improve existing generic mechatronic competences and technologies to strengthen the competitive edge of its member companies
FMTC bridges the research gap between academia and industry

Universities & Research Centres (PMA)

FMTC

Consulting Centres (Sirris)

Companies

1. Universities & Research Centres (PMA)
   8

2. FMTC
   48

3. Consulting Centres (Sirris)
   370

ytp = year to product

6 ytp
4 ytp
2 ytp
Demand-driven collective projects

+/- 50 project ideas

Clustering

Company Interest Selection

Company Interest

Advisory Board

+/- 7 projects
FMTC in graphs (2008)

- **Figure 2:** FMTC resources (person days) by project type in 2008
- **Figure 3:** FMTC resources (person days) by activity type in 2008

**Budget 2009:** +/- 4,6 M€
Structure FMTCplus: 3 knowledge clusters with one top competence

**Ecological Machines**
- Energy-efficient electro-mechanical drive lines
- Control design
- Electrical actuators
- System modeling
- System design

**Flexible Machines**
- Wireless Control Architectures
- Industrial communication
- Control software
- System Engineering

**Intelligent Machines**
- Smart self-diagnostics
- Condition Monitoring Algorithms
- Customized sensing
- Networked Machines

**Networked Machines**
Apart from small demo programs (mostly trying to reproduce bugs 😊), FMTC uses xenomai “underneath” orocos
Xenomai in FMTC projects?

- [past] Fieldbusses
  - Development of EtherCAT stack
- [past] Open Real-time Control
  - Cfr Presentation Peter Soetens/Markus Klotzbuecher
- Model based software design
  - “Generating orocos components”
- FMTC Technology demonstrator: badminton robot
  - Central controller runs orocos-on-xenomai
- Testing and debugging with a machine emulator
Testing and Debugging with a machine emulator

- No need for real machine Hardware
- Emulating machine behaviour
- Automated testing (Salome TMF)
- Record/Replay debugging
- Up to 10 Khz periodic loops
Testing and Debugging with a machine emulator
Testing and Debugging with a machine emulator & Xenomai

Orocos Components - Your component here

Real-Time Toolkit

Component Infrastructure

- Distribution and Communication
- Scripting
- XML config.

Device Interface

Native OS Libraries

CanFestival

Comedi

Xenomai

Core Primitives and OS Abstraction
FMTC “wishlist”

- (integrated and ready-to-use) Device drivers
- Simplified usage model
  - SOLO? Preempt-RT?
  - Strong RT/non-RT separation vs. benefit from mainline (RT?) drivers?
  - Skin conflicts?
- Easy deployment (packages)
- Testing, debugging and tracing capabilities (for mere mortals 😊)
  - virtualization based testing