

Seminar and Hands-On on Orocos

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V Jornades de Programari Lliure
Barcelona

Outline

- 1 Orocos Applications
 - Machine Control
 - Adaptive Control
 - Shared Control
 - Vision Integration
 - Distributed Control
- 2 Orocos Introduction
- 3 Use Case: “RoboCatcher”
- 4 Getting Started with Orocos

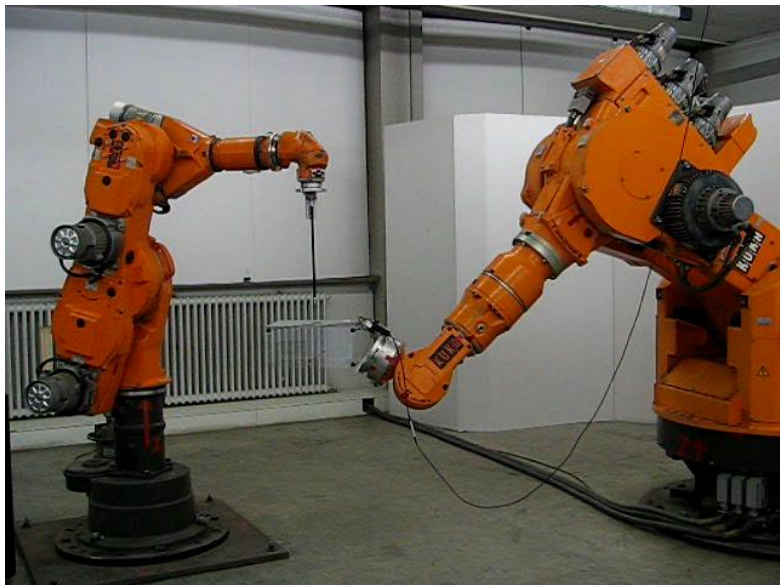
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Axes Control



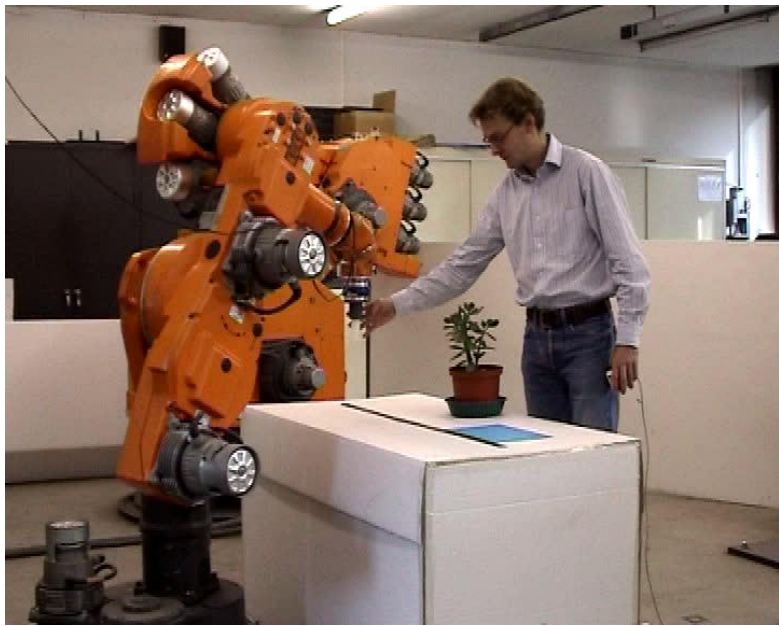
Constraint Based Control



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Online learning



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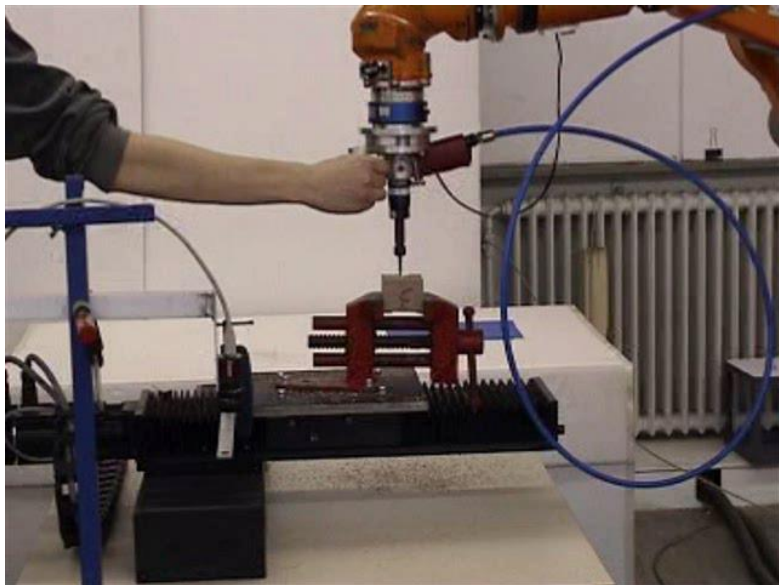
Placing a Car Window



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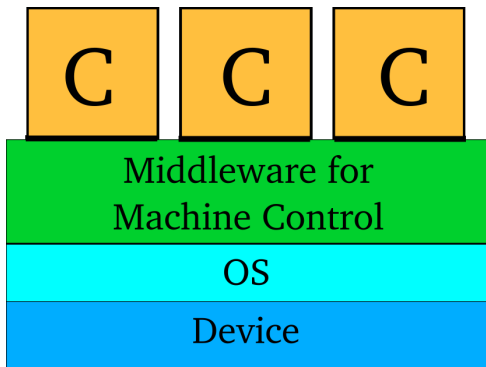
Milling a Human Bone



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Distribution in progress...

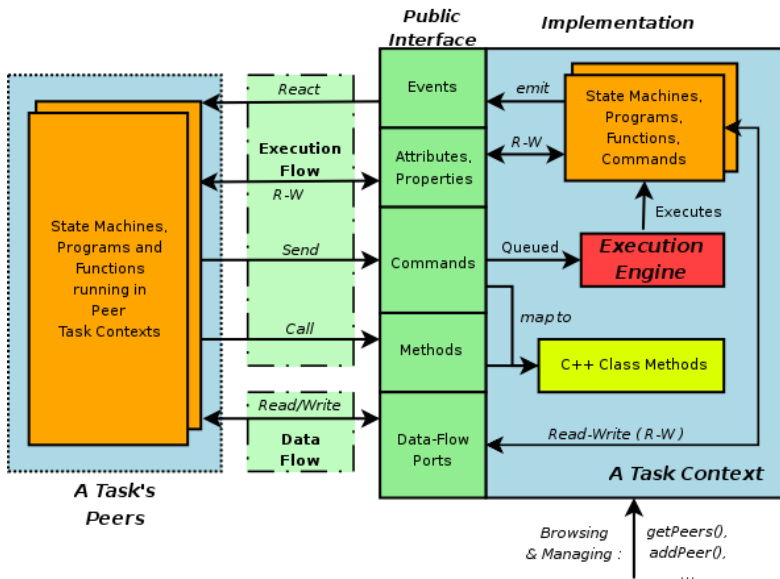


Orocos Introduction Presentation

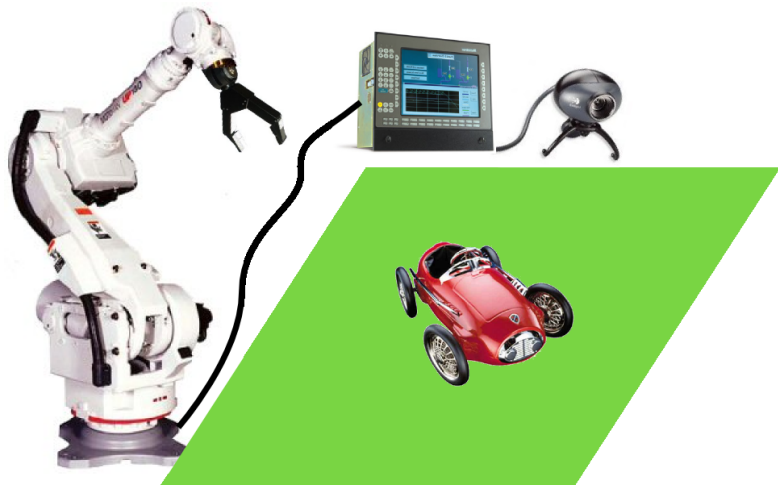
Freely available on:

<http://www.oroocos.org>

The Orocos Component: "TaskContext"



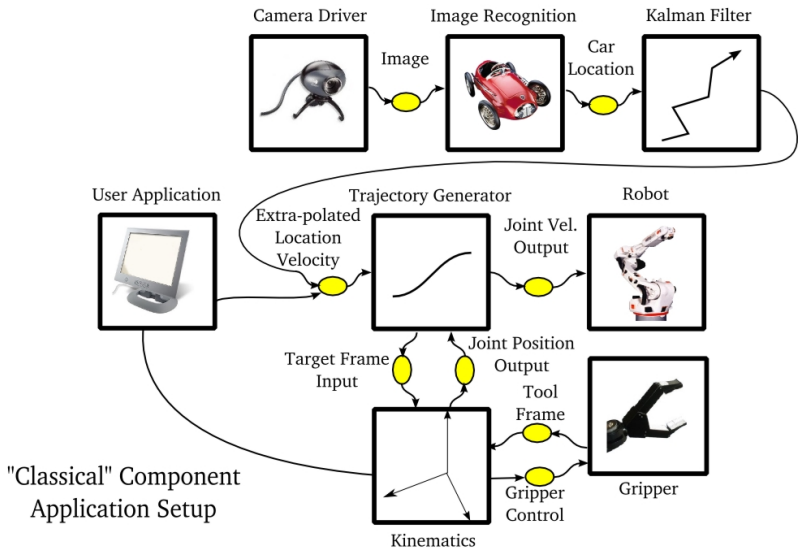
RoboCatcher: Research Application



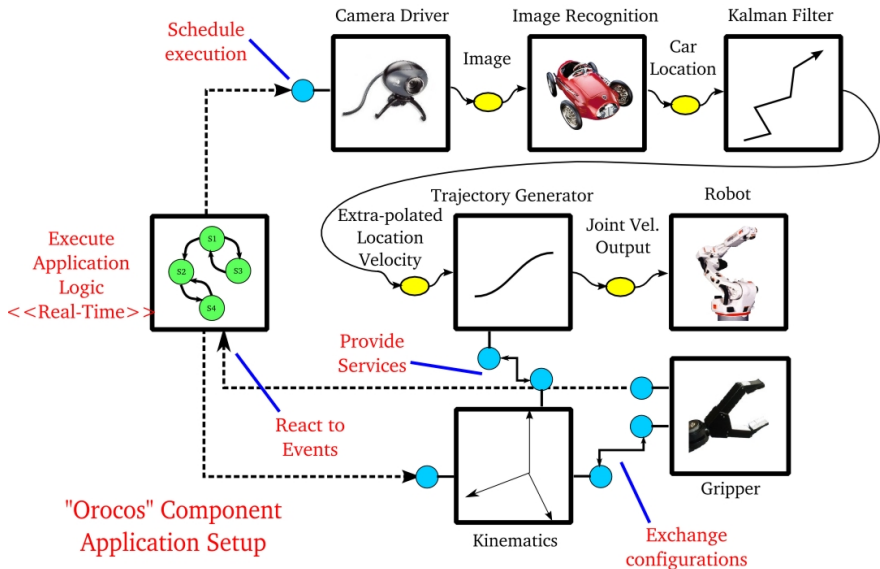
RoboCatcher: Requirements

- Software Framework
 - Modular - Component Based
 - Online reconfiguration
 - User interactivity
 - Real-Time
- Application Code
 - Camera capturing
 - Car image recognition
 - Car state estimation
 - Online trajectory generation
 - Robot kinematics algorithm
 - Robot/gripper interfacing

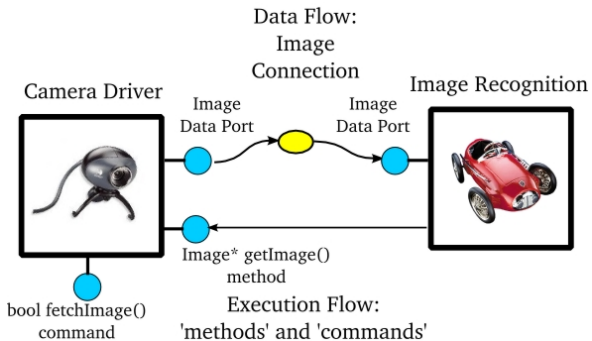
RoboCatcher: Without Orocos



RoboCatcher: With Orocos

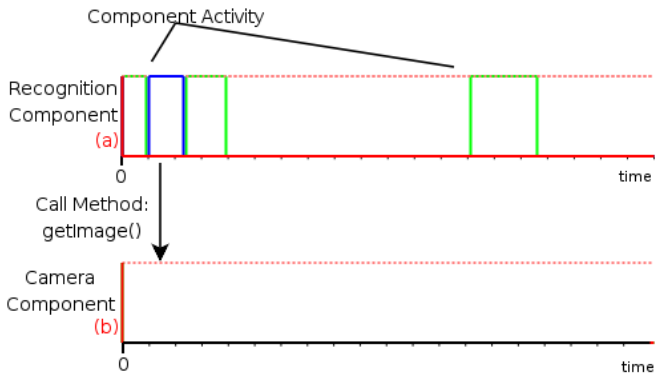


RoboCatcher: Camera



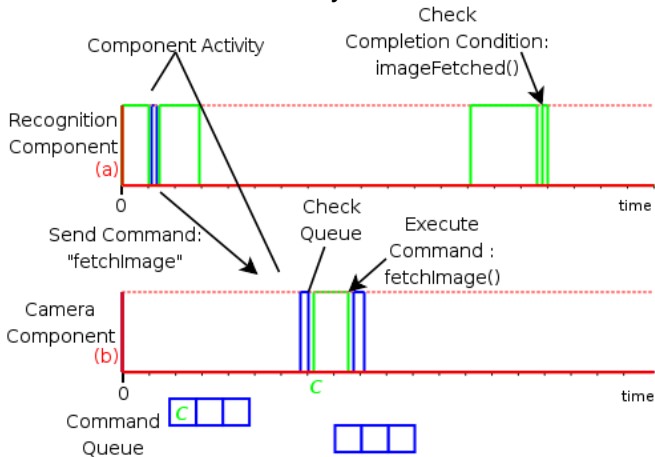
Camera Methods

Methods : Synchronously *call*



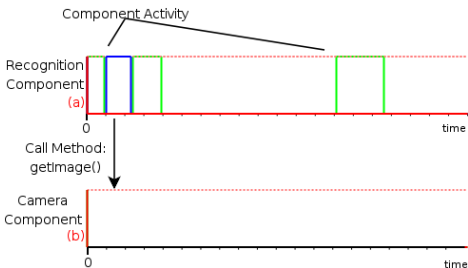
Camera Commands

Commands : Asynchronous *send*

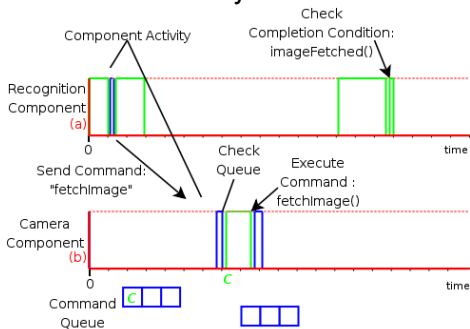


Camera Execution Flow

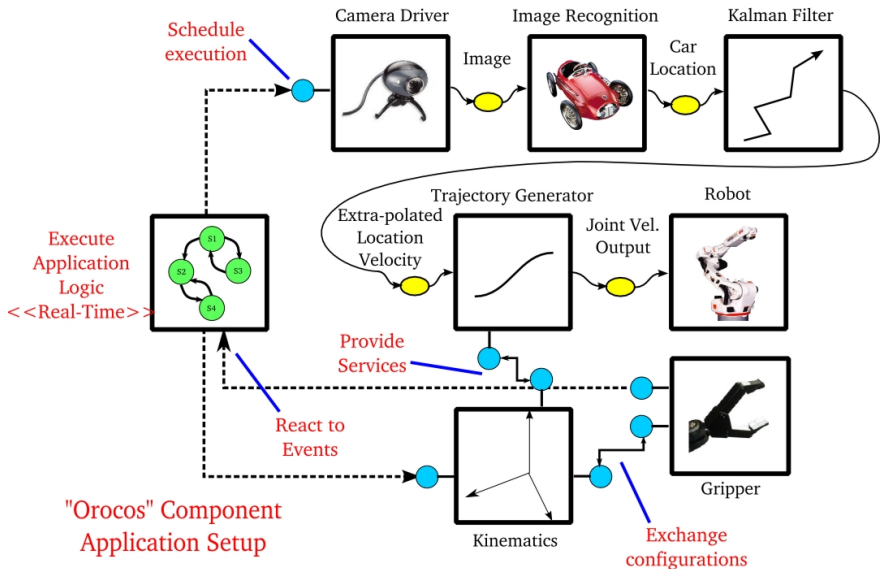
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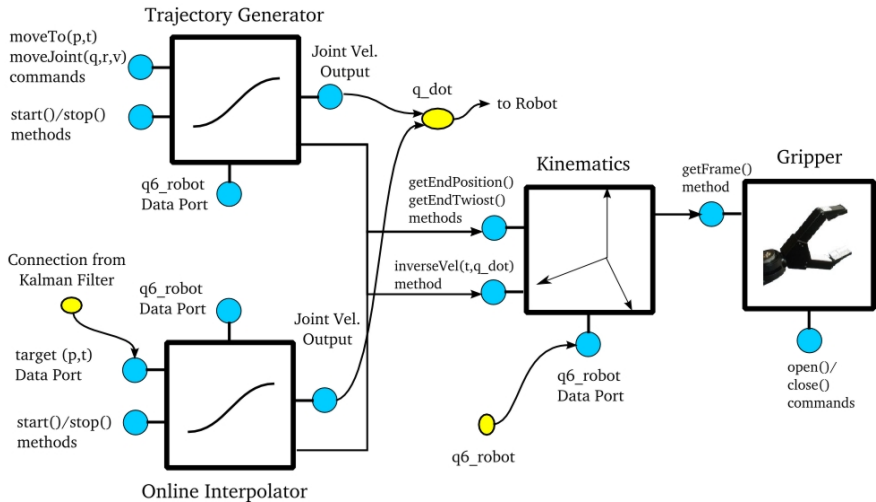
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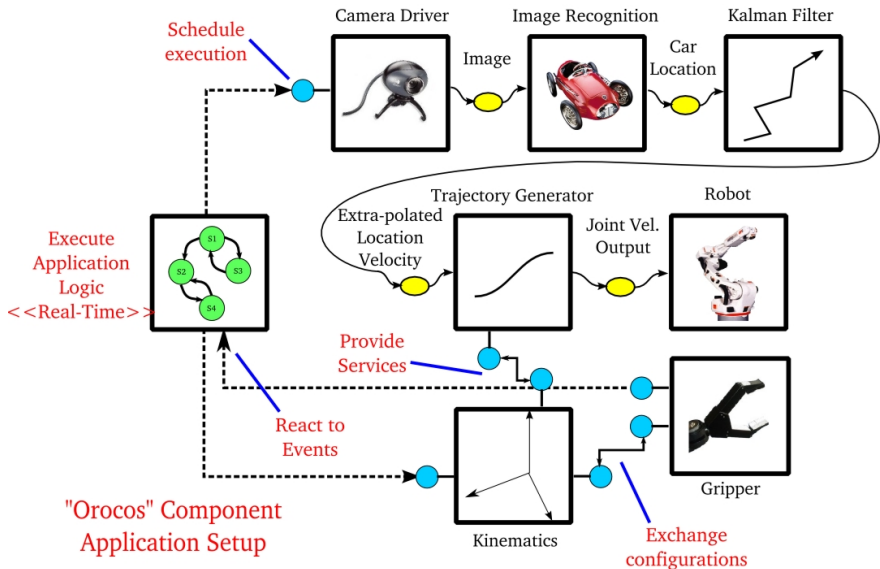
RoboCatcher: With Orocos



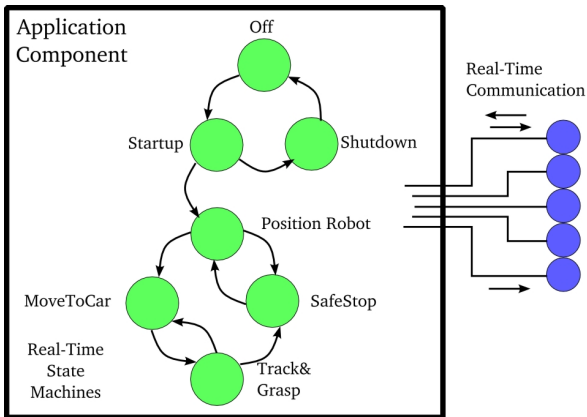
RoboCatcher: Kinematics



RoboCatcher: With Orocos



RoboCatcher: Application Logic



Diving Into the Application Code

- Task Browsing
- State Machines
- Interactive Scripting
- Creating your first Component

Conclusion

Orocos offers

- a software toolkit for building real-time components
- rich online browsable component interface
- user defined real-time state machines

Further Reference:

<http://www.oroocos.org>