A New Robotic Technology Middleware and Robotic Technology Component Interoperability Demonstration

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Today

We are pleased to announce

a NEW

Robotic Technology Middleware
Agenda

- Concept
- Architecture
- Main features
- Demonstration
Bring power of MBD and V-model to real-time robotic software development
System is modeled as UML diagram

- **System (Components)**
  - System design tool
  - System description language (UML)

- **Component**
  - Component design tool
  - RT-Component (DF, FSM)

- **Component Template (C++, Python)**

- **RT-Middleware**

- **OS**
Main Features

- Model-Based Development
- State Machine Component
- Real-time Middleware
Main Features

- Model-Based Development
- State Machine Component
- Real-time Middleware
Model-Based Development

• Users can do with UML editor:
  – Design a system
  – Configure components in the system
  – Generate RT-Component template
  – Monitor components
Model-Based Development

UML design tool is the center place of development process
Model-Based Development

- Design a system with UML
Model-Based Development

- Configure components in the system
Model-Based Development

- Monitor components in the system
Main Features

- Model-Based Development
- State Machine Component
- Real-time Middleware
State Machine Component

- Embedded FSM in Data Flow Component
  - Events are input from data ports
- FSM is modeled with UML Statechart
Why not Statechart?

- Lots of robotic software includes state machines in its code
- Coding state machine by hand makes things bad
  - Only you can understand it
  - For a few months...

Leave your efforts in the reusable way
Main Features

Model-Based Development

State Machine Component

Real-time Middleware
Real-time Middleware

• Enhancements for RTOS
  – Runtime configuration
    • Fast data port types
    • Bus communication protocols

Full functionality is available
Demonstration

2 Roombas are synchronously changed their action by gestures

- To show *interoperability* of Honda RTM and OpenRTM-aist
  - Honda RTM provides:
    - Action state component (mode changer)
    - Roomba component (controller)
  - OpenRTM-aist provides:
    - Kinect component (UI)
    - Roomba component (controller)
Enjoy it!