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Rapid Robot Prototyping: an open source / open hardware framework for service robot development

<u>M. Matteucci</u>, M. Migliavacca, A. Bonarini Dept. of Electronics, Information and Bioengineering Politecnico di Milano, Milan, Italy Robotics research needs (at least) a robot ...

- Physical platform (i.e., mechanics, electronics)
 + Software components (e.g., localization, ...)
- Most of time spent in trying to cope with engineering problems (hacking?)
- Little time (and resources) left for research

We would like standardized approaches to:

- Mechatronic modules and components
- SW integration and components reuse
- Development tools and libraries
- Communication protocols ...





Yes! ROS (Industrial) is a noticeable counterexample, but ...



Rapid Robot Prototyping approach

- Open source schematics, layouts, and code
- Massive HW/SW component reuse
- Real-time publish/subscribe over CAN bus
- Seamless integration with ROS





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An HW/SW framework for robot development

- Common requirements implemented by off-the-shelf HW/SW components
- Distributed control architecture with real-time publish/subscribe communication
- Open source HW/SW with 6 modules already available, 8 more under development













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