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RESEARCH CAMPS

Through so-called research camps BRICS reaches out to the robotics community for joint developments and dissemination purposes. Other than a regular workshop, where people meet to discuss and exchange information in a relatively short time frame, research camps typically last between one and two weeks and have tangible results, e.g., a software library of specific robot functionality which will then become a contribution to the BRICS Open Code Repository.

BRICS research camps will be attended by highly qualified engineers, Ph.D. students and senior researchers. They will have access to some of the most advanced robotic hardware available today on which the jointly developed software will be validated through showcases with industrial and academic relevance.

CONSORTIUM

KUKA

GPS Gesellschaft für Produktionssysteme

Bonn-Rhein-Sieg University of Applied Sciences

CATHOLIC UNIVERSITY LEUVEN

Fraunhofer IPA

UNIVERSITY OF TWENTE

BLUEBOTTICS

www.best-of-robotics.org

BRICS is a joint research project funded by the European Commission 6th Framework Program under the contract IST-2004-02904 and runs until February 2012.
THE PRIME OBJECTIVE OF BRICS IS TO STRUCTURE AND FORMALISE THE ROBOT DEVELOPMENT PROCESS AND TO PROVIDE DEVELOPMENT TOOLS, COMPONENTS AND TOOLS, AND FUNCTIONAL LIBRARIES, WHICH ALLOW ENGINEERS AND DEVELOPERS OF COMPLEX ROBOTIC SYSTEMS TO REDUCE THE DEVELOPMENT TIME AND EFFORT BY AN ORDER OF MAGNITUDE.

BRICS WILL WORK TOGETHER WITH ACADEMIC AND INDUSTRIAL PROVIDERS OF ROBOTIC COMPONENTS TO IDENTIFY AND DOCUMENT REAL BEST PRACTICES IN THE DEVELOPMENT OF COMPLEX ROBOTIC SYSTEMS, TO REDUCE EXISTING COMPONENTS IN ORDER TO ACHIEVE A MUCH HIGHER LEVEL OF REUSABILITY AND ROBUSTNESS, AND TO SUPPORT THE ROBOT DEVELOPMENT PROCESS WITH A WELL-STRUCTURED TOOL CHAIN AND A REPOSITORY OF REUSABLE, CONFIGURABLE CODE.

THE OBJECTIVES OF BRICS ARE:

- To promote the interoperability of hardware and software components by harmonising the interfaces and the communication between these components.
- To define and implement showcases, which allow measuring and evaluating the progress between today’s practices and the BRICS robot development process.

APPROACH

To achieve its objectives, BRICS will undertake four lines of R&D activities in cooperation with all interested stakeholders:

- Provision of hardware components with harmonised and open interfaces.
- Identification of best practice in robot algorithm, software components, and architectures.
- Design of an integrated robot development environment that supports rapid and flexible configuration of new robot platforms and the development of new robot applications.
- Cross-sectional activities addressing robust autonomy, openness and flexibility, and harmonisation and benchmarking.

Through realistic showcases relevant for both providers and users of robotics systems and components in industry, research and education the scientific and technological progress of the project will be measured and evaluated.

BRICS will develop two major complementary software packages:

- BRIDEE (BRICS Integrated Development Environment) will be based on the well-supported and widely adopted Eclipse platform. The software engineering methodology behind this is Model-Driven Engineering (MDE), which provides developers with best practice models that
  - allow for designs with higher-level, abstract components,
  - hide the details of implementations and middleware, and
  - support automatic model validation and code generation, where appropriate.

- BRICERE (BRICS Open Source Repository; pronounced „broker“) offers interoperable interfaces and source code components that implement a wealth of robotics functionality, especially for the application programming interfaces (APIs) defined in the project. BRICERE will provide an initial repository of easy-to-use, best practice software components covering the most relevant, but certainly not all desirable robotics functionalities. This initial repository is expected to convince other stakeholders of the advantages of using the BRICS methodology and software tools. Their involvement will then result in a gradual extension of the code repository.

The following user groups will benefit from the integrated robot software development environment, the interoperable robotics components, and the robotic research platforms provided by BRICS:

- Robotics researchers can make use of hardware, which comes with a consistent set of harmonised, well-documented APIs, and an integrated software development environment. This enables researchers to avoid so-called „from scratch developments“ as BRICS gives them the tools to develop complex operational robotic systems with minimal effort thereby allowing them to concentrate their resources on research rather than wasting them on the development of research infrastructure.

- Hardware manufacturers may benefit from an increased uptake of those products for which they offer BRICS interfaces. Their products may in turn be enhanced with functionality from the code repository. Finally, they may receive valuable input from the BRICS community.

- System integrators can utilise the development environment to significantly accelerate the process of integrating components into robotic systems and to speed up the development of software for advanced robotic applications.

- Software developers have access to a consistent set of harmonised and openly available APIs for which they can offer [commercial or open source] implementation that are directly usable via the integrated development environment.