Making Research Visible
Cross Platform Linking of Semantically Enriched Research Artifacts

Cognitive Interaction Toolkit

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CITEC
Bielefeld University

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Agenda

- Introduction
  - The vision
  - Cognitive Interaction Technology (CITEC)

- Collaborative Research Environment
  - Collaborative development environment
  - Continuous integration server and Open research/data server
  - Pub service by Bielefeld University Library

- Cognitive Interaction Toolkit Platform + Live Demo

- Conclusion and Discussion
1 Julian is a researcher in the field of neurocognition and has developed a new method with corresponding software toolset that he has evaluated thoroughly. Julian likes the idea of Open Research and makes his software and his test data available. He marks the current state of both software and data and adds a description that links both research output artifacts to each other, the field of research and his institution and himself. He presents the method on a conference. After the conference he releases the paper to the public, too, and adds it to the description.

2 Jack is a researcher in the field of neurocognition, too, and is especially interested in the coordination of motion of human upper limbs and hands. He attends Julian’s talk that addresses a problem field he is working on for a long time and, hence, has great interest in. The new method introduced in the talk may save Jack a lot of work in further research. Jack marks the talk in his conference programme to come back to the talk later.

3 Back at his office computer, Jack quickly locates the paper on the internet. After a quick check of the reference data he is sure he has picked the right paper. Jack is able to obtain the full paper and thus is able to study the research work in detail. Jack fetches the corresponding software source code and executable in the version that corresponds to the paper and the test data set that was used as basis for the work described in that paper.
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Introduction to CITEC

- The CITEC was founded at Bielefeld University as one of 37 german clusters of excellence.
- Creating cognitive abilities in technical systems.
- Advancing our scientific understanding of the principles and mechanisms that enable seamless cognitive interaction.
- Creating bridges between the cultures of engineering and humanity.
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Introduction to CITEC

- Structure
  - 4 Research Areas
    - A: Motion Intelligence
    - B: Attentive Systems
    - C: Situated Communication
    - D: Memory and learning
  - More than 35 groups from diverse fields of study
  - 60+ Research projects and sub-projects
  - Industry cooperations
CITEC has an interdisciplinary approach and brings together researchers from computer science and robotics, linguistics, biology and physics, and psychology and sport science.
CITEC Collaborative Research Environment

- Collaborative development environment: Redmine
  - Internal collaboration
  - 100+ projects
  - 500+ developers
  - Source code repositories (git and subversion)
  - Wiki
  - Bug/Issue tracker
  - Document storage
  - ...
Dialog–Demonstrator

Overview

Subversion repository: https://projects.cit-ec.uni-bielefeld.de/svn/dialog-demo

Issue tracking

- Bug: 6 open / 18
- Feature: 2 open / 3
- Support: 1 open / 2
- Meeting: 0 open / 0
- Event: 0 open / 0
- Equipment: 0 open / 1
- To-Do: 0 open / 0

View all issues | Calendar | Gantt
Open research/source also based on Redmine

- Internal and external collaboration
- Wiki
- Subversion and git source code repositories
- Bug tracker
- Activities
- Data sets as files, e.g.: XML, CSV, C3D for grasping data
- ...

CITEC Collaborative Research Environment
XTT – eXtensible Task Toolkit

Overview

XTT implements the Task-State-Pattern, which provides a multi-stage communication interface for robot-task-servers. Servers can report both when a task begins and when it ends independently, and there are also (optional) functions for updating task goals and canceling tasks, all in one consistent interface. Furthermore, the toolkit supports both synchronous and asynchronous use.

At the moment, there is a full implementation in Java, based on XCF4J (xtt-java) and an experimental version on Python, for RSB (xtt-python).

Members

Manager: Ingo Lütkebohle
Developer: David Klotz, Jan Moringen, Maikel Linke

Latest news

XTT 2.0 beta
XTT 2.0 beta is now available, supporting both RSB and XCF.
Added by Ingo Lütkebohle about 1 month ago

View all news

Issue tracking

- Bug: 0 open / 0
- Feature: 4 open / 5
- Support: 1 open / 1

View all issues
Kinematic data of grasping movements directed towards virtual and real objects was generated for the MINDA and CORTESMA CITEC Projects. Eleven right-handed subjects (age: 24-39 years, 4 women) participated in a series of three experiments. All subjects had normal or corrected-to-normal vision and had no known impairments related to arm or hand movement. All subjects gave written informed consent to be part of the study. The experiment was carried out according to the principles laid out in the 1964 Declaration of Helsinki. Subjects performed all three experiments in the same order, starting with Experiment 1, directly followed by Experiment 2, and then Experiment 3.

The experiments were carried out at the Manual Intelligence Lab, making use of its sophisticated multimodal set-up for investigating manual interaction (Maycock et al., 2010). During the data collection, the subjects stood in front of a table (with dimensions 210 x 130 x 100 cm). Subjects wore an Immersion CyberGlove II wireless data glove (Immersion Corp., San Jose, CA; data acquisition rate: 100Hz; sensor resolution: c1°) on the right hand that allowed for the recording of whole hand kinematics (22 DOF). In front of the subject (at a distance of 40cm), a holding device for spherical objects (golf tee) was positioned on the table. A laptop computer screen was positioned behind the holding device. A small round bowl (10cm in diameter) located 40cm to the right of the holding device served as
CITEC Collaborative Research Environment

- Continuous Integration Server
  - Internal use and external view
  - Software status and notifications
  - Dependency tracking
  - Binary artifacts
  - Test reports
  - Deployment
Welcome to the Central Lab Facilities Continuous Integration Server

Preliminary Job convention scheme: [Project I Department]-JobName-[trunk I version]

For support, please contact: clfwww@techfak.uni-bielefeld.de

Please join: CLF CI User Group

Service brought to you by: Central Lab Facilities

Happy building!

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BUILD QUEUE

No builds in the queue.

BUILD EXECUTOR STATUS

**Ubuntu32-Lucid**

1. Building AI-MMTracking-1.x #7
2. Idle
3. Idle
4. Idle
5. Idle
6. Idle
7. Idle
8. Idle

**Ubuntu32-Oneiric**

1. Idle
2. Idle
3. Idle
4. Idle

**Ubuntu64-Lucid**

1. Idle
CITEC Collaborative Research Environment

- PUB - Publications at Bielefeld University
  - Central University Library service integrated in CITEC infrastructure
  - Allows distributed management and maintenance of publications
  - Aggregation - per use case - also available via SRU interface
PUB - Publications at Bielefeld University

PUB represents the central publication data service of Bielefeld University. It serves Bielefeld academics to easily create and administer their personal publication lists and make them available on the web.

**PUB in a Nutshell**

By default, the lists are publicly available as part of the contact page within the directory of staff and departments of the university (PEVZ). Moreover, individuals, chairs, faculties and central academic institutes use the flexible and discipline specific presentation options for their publication activities.

**Embed Publication Lists**

We regularly update the PUB database from Web of Science and import publication data from PubMed, arXiv.org or Inspire on request. PUB enables data to be imported from several reference management systems as well.

**Import from Reference Management Systems**

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**Import from Reference Management Systems**
Center of Excellence Cognitive Interaction Technologies

Florian Lier

CITEC Collaborative Research Environment

- Computer-Supported Cooperative Work (CSCW)
- Open research featuring open source software
- Open data featuring open data sets
Workspace: All researchers have their own research culture, established practices, infrastructures, and produce or work with diverse kinds of research artifacts: publications, open data sets, software ...
...so let’s aggregate ...

Entity modules:
A CitComponent serves as a container. A «build» is an entity and can be attached to any CITComponent, also a publication and of course a data set.

HTML+RDFa, RDF, XML, JSON representation
Cognitive Interaction Toolkit Platform

...and combine.

System ABC

CitComponent A
- MetaInfo: Authors, Categories, Wiki, SCM location, BugTracker,
  Tags, Homepage...
- Software Builds with Artifacts
- Publications
- Related data sets

CitComponent B
- MetaInfo: Authors, Categories, Wiki, SCM location, BugTracker,
  Tags, Homepage...
- Software Builds with Artifacts
- Publications
- Related data sets

CitComponent C
- MetaInfo: Authors, Categories, Wiki, SCM location, BugTracker,
  Tags, Homepage...
- Software Builds with Artifacts
- Publications
- Related data sets

HTML+RDFa, RDF, XML, JSON representation

Florian Lier
Cognitive Interaction Toolkit Platform

LIVE DEMO
Cognitive Interaction Toolkit Platform

Still BETA ;)
**Conclusion**

- Several research artifacts can be retrieved and linked in our platform
- Almost every artifact can be easily imported, enriched and published
- There’s still some work to be done on the RDF renderer
- We need “source” back links, e.g.: ClServer --> ToolKit
- More data!
- SPARQL interface (coming soon)
Thank you for the attention!