AI-related Research conducted by GEIST

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Otwarte seminarium członków oraz sympatyków PSSI
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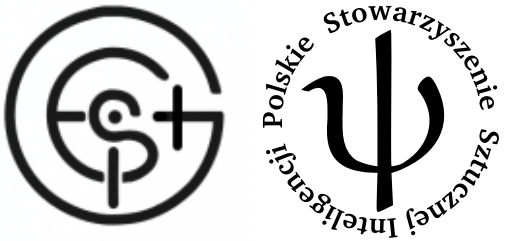

Outline

1. **About us**
2. **Main research areas**
   - Business Intelligence
   - Ambient Intelligence
3. **Thank you**

Group for Engineering of Intelligent Systems and Technologies

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About GEIST

Group for Engineering of Intelligent Systems and Technologies

- Coordinated by: dr hab. inż. Grzegorz J. Nalepa.
- Scientific supervision: Prof. dr hab. inż. Antoni Ligęza

GEIST is a part of:

- Department of Applied Computer Science
- AGH University of Science and Technology

Main research areas

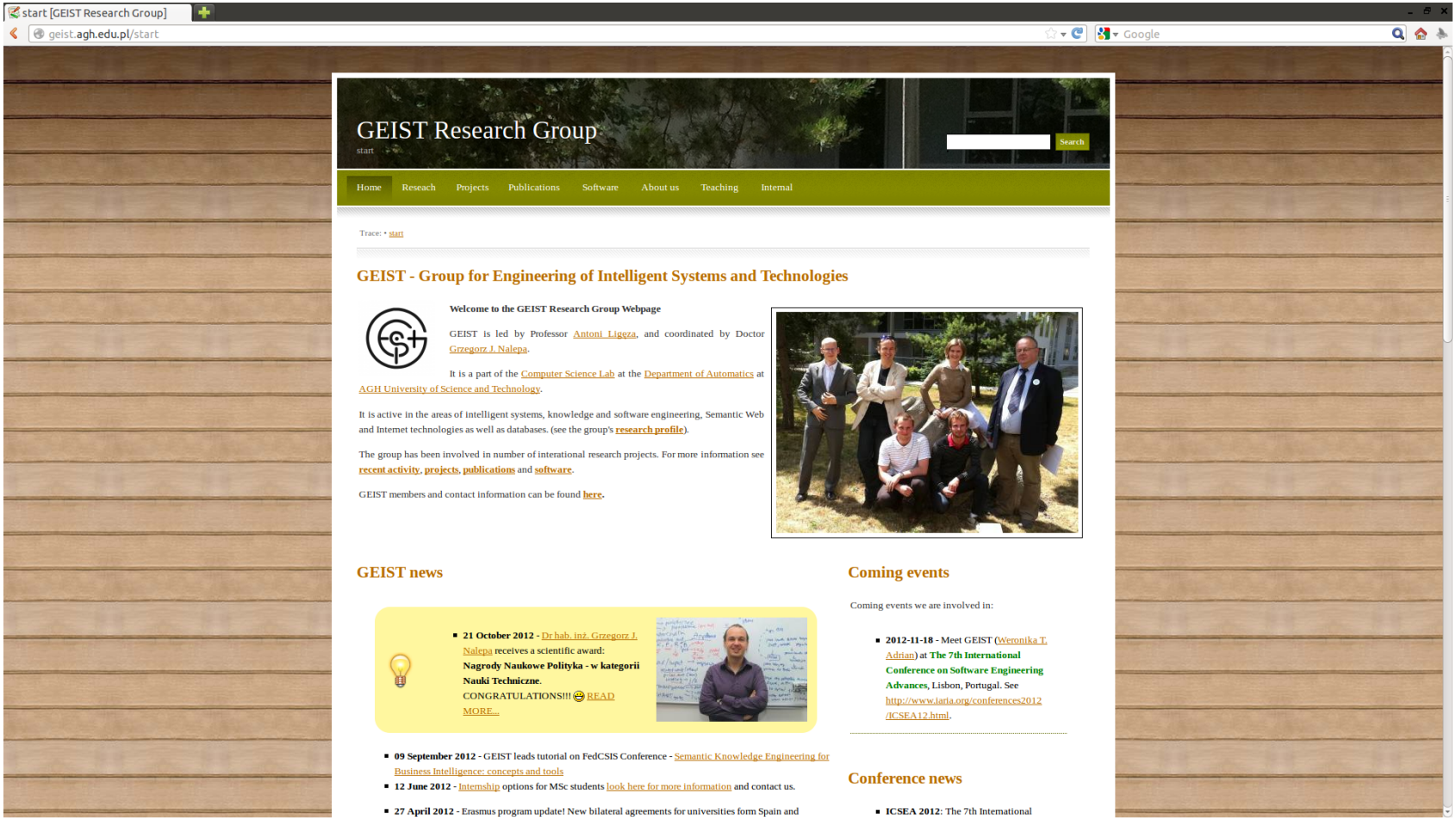
- Design, Implementation and Verification of Rule-Based Systems and Business Rules
- Semantic Knowledge Engineering, Semantic Wikis
- Engineering of Intelligent Systems
- Business Intelligence
- Ambient Intelligence

GEIST Team

Dr hab. inż. Grzegorz J. Nalepa

- Prof. dr hab. inż. Antoni Ligęza
- Dr hab. Marcin Szpyrka
- Dr inż. Sławomir Nowaczyk
- Mgr inż. Weronika T. Adrian
- Mgr inż. Szymon Bobek
- Mgr inż. Krzysztof Kaczor
- Mgr inż. Krzysztof Kluza

GEIST Website



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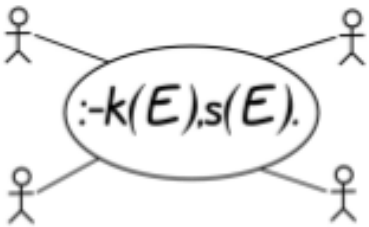
Recent activities



Didactics: Engineering of Intelligent Systems

New graduate studies

Starting spring 2013

- knowledge representation and reasoning
- machine learning and robotics
- Business Intelligence systems
- Semantic Web technologies
- Ambient Intelligence and mobile applications
- AI in games, NLP and Recommender Systems
- R&D seminars with invited guests
- creativity workshop based on Stanford experience

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Business Rules

Knowledge representation

- Formal languages for knowledge representation — ALSV(FD) logic.
- Visual rule languages — XTT2 rule language.
- Custom inference algorithms.

Knowledge integration

- Semantic rule interoperability.
- Integration of Business Rules and Business Processes.

Deliverables

A complete design framework providing set of tools:

- Visual Business Rules editor — HQEd.
- Dedicated inference engine — HeaRT.
- Quality analysis module — HalVA.

Business Processes

Modeling

Integration of the HeKatE tools with a selected BPMN tools

Runtime

Application of the HeaRT rule engine for executing selected BPMN models

Analysis

2 levels are considered

- local verification (for BPMN elements as well as rule tables in BPMN tasks)
- global verification (for BPMN models)

Recent activity: Tutorial at FedCSIS 2012

Title: Semantic Knowledge Engineering for Business Intelligence – concepts and tools

- summary of the last few years of research
- presentation of methods and tools developed within our projects

List of topics

1. SKE: Introduction, Concepts, and Design Process
2. Rule Formalization with ALSV(FD) and XTT2
3. Practical Implementation of the SKE Approach
   - Visual Rule Modeling with HQEd
   - Rule Execution in HeaRT
4. Rule Design for the Semantic Web and Knowledge Modeling with Loki
5. Methods for Visual Modeling of Rules. Integrating Rules with Processes towards Semantic Business Intelligence

Current projects

Research & development project

- Prosecco – Processes, Semantics and Rules for Management of SME
- Consortium with Softhis sp. z o.o. and Politechnika Poznańska

Research projects

- SaMURaI – Methods for Rules Interoperability
- HiBuProBuRul – Hierarchical Business Process and Business Rules Modelling

Didactics within *Engineering of Intelligent Systems* studies

- Business Intelligence Modelling
- Rule-based Decision Support
- R&D Seminars

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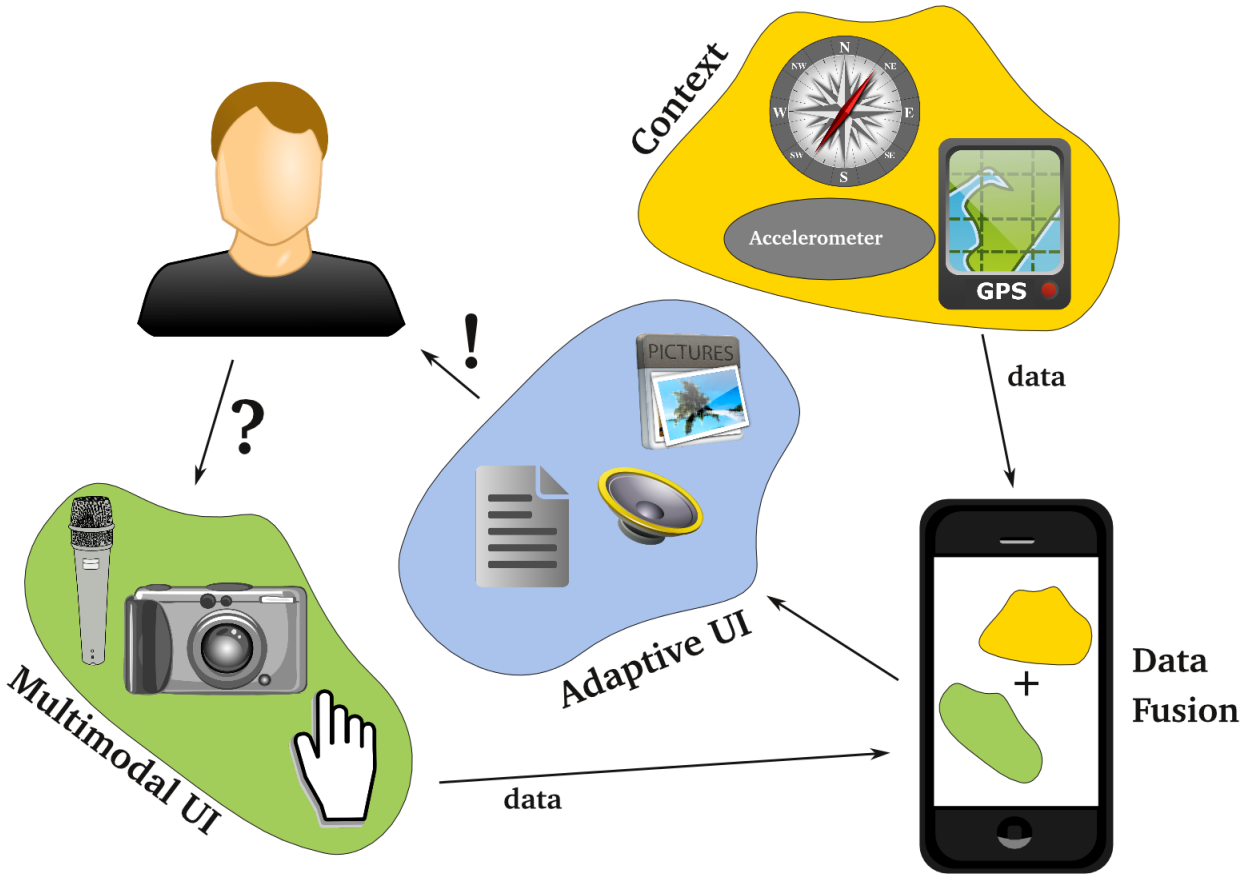
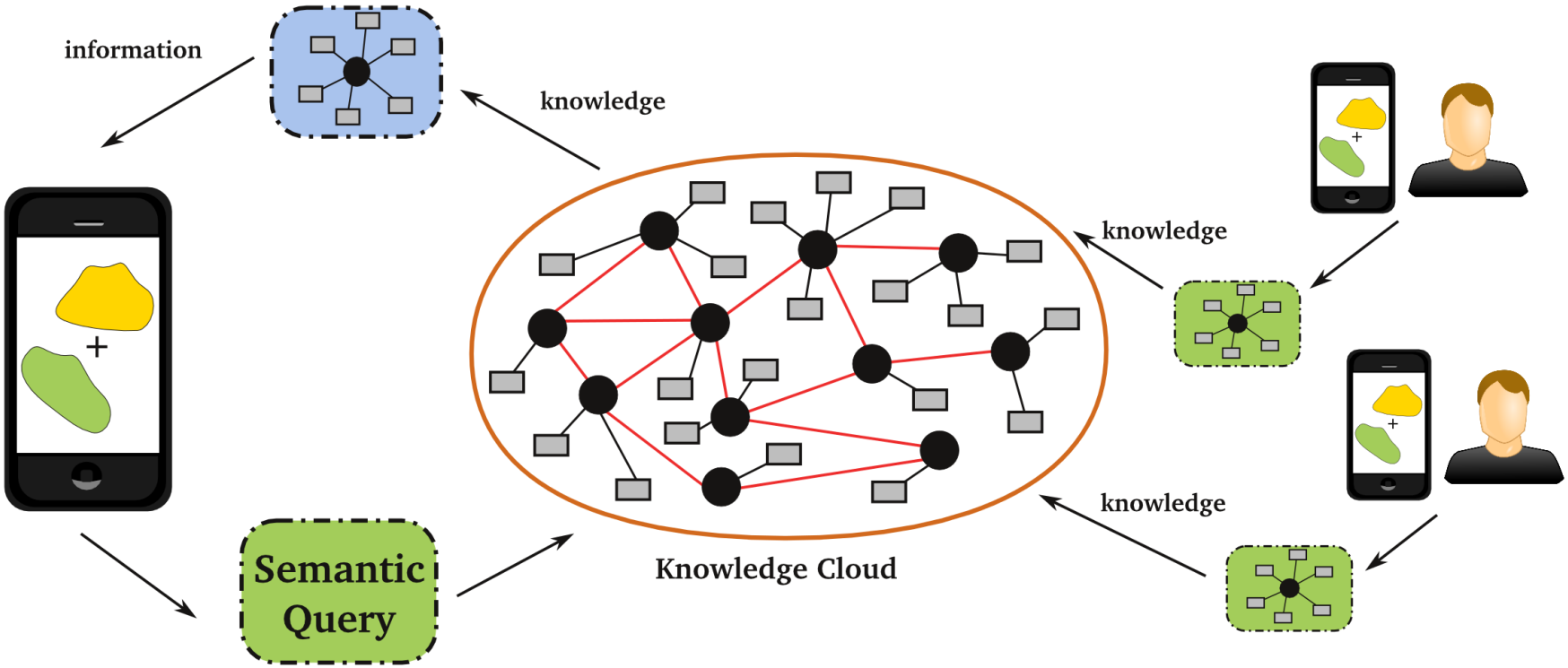
Intelligent user interfaces



Ambient Intelligence

- simple input - complex processing - simple output
- semantic queries with parameters defined by context
- rules capturing user preferences
- semantic hinting assisting the user
- Intelligent Adaptive UI: presentation of information depending on context

Semantic knowledge engineering



Current projects

Ambient Intelligence Laboratory

- 16 notebook workstations
- 4 tablets
- 2 smartphones
- 1 Smartboard
- 2 augmented reality glasses

Projects – applications

- Context- and Content-Adaptative Communication Networks
- Adaptive Context-Aware Augmented Reality Interfaces

Didactics within *Engineering of Intelligent Systems* studies

- Ambient intelligence
- Machine learning
- Semantic Web Technologies
- Human computer interaction

Thank you for your attention

Thank you for your attention!

Do you have any questions?

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