

# GEIST Winter of Code

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Spotkanie Geist Winter of Code 2012  
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<http://geist.agh.edu.pl>



# Outline

## 1 About us

## 2 Main research areas

- Business Intelligence
- Ambient Intelligence

## 3 Geist Winter of Code

- Ambient Intelligence
- Business Rules/Processes

## 4 Thank you



## Group for Engineering of Intelligent Systems and Technologies

<http://geist.agh.edu.pl>

## 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

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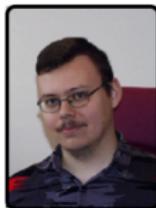


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Dr hab. inż. Grzegorz J. Nalepa

- 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

The screenshot shows the homepage of the GEIST Research Group website. The header features the title "GEIST Research Group" and a navigation menu with links for Home, Research, Projects, Publications, Software, About us, Teaching, and Internal. Below the header is a banner image of a group of people outdoors. The main content area includes a welcome message, a photo of the research group, news items, coming events, and conference news.

**GEIST - Group for Engineering of Intelligent Systems and Technologies**

Welcome to the GEIST Research Group Webpage

GEIST is led by Professor [Alessio Ligozzi](#), and coordinated by Doctor [Gregory J. Nalaga](#).

It is a part of the [Computer Science Lab](#) at the [Department of Automatics](#) at AGH University of Science and Technology.

It is active in the areas of intelligent systems, knowledge and software engineering, Semantic Web and internet technologies as well as databases. (see the group's [research profile](#)).

The group has been involved in number of international research projects. For more information see [recent activity](#), [projects](#), [publications](#) and [software](#).

GEIST members and contact information can be found [here](#).

**Coming events**

Coming events we are involved in:

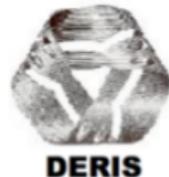
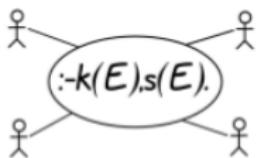
- 23 October 2012 : Dr hab. prof. [Gregory J. Nalaga](#) receives a scientific award: Nagroda Naukowa Polityki w kategorii Nauki Techniczne. CONGRATULATIONS! [READ MORE...](#)
- 2012-11-16 : More GEIST (members, 2 editions) of The 7th International Conference on Software Engineering Advances, Lisbon, Portugal. See <http://www.iwslab.org/workshops/2012/ICSEA12.html>.

**Conference news**

- 09 September 2012 : GEIST leads (initial) on FcNCNS Conference - [Semantic Knowledge Engineering for Business Intelligence, reasoning and tools](#)
- 12 June 2012 : [Internship](#) options for MSc students (look here for more information and contact us).
- 27 April 2012 : [Executive program update: New bilateral agreements for universities from Spain and](#)
- ICSEA 2012: The 7th International

<http://geist.agh.edu.pl>

# Recent activities



## 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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## 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.

## 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)

# 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

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

## Engineering of Intelligent Systems

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

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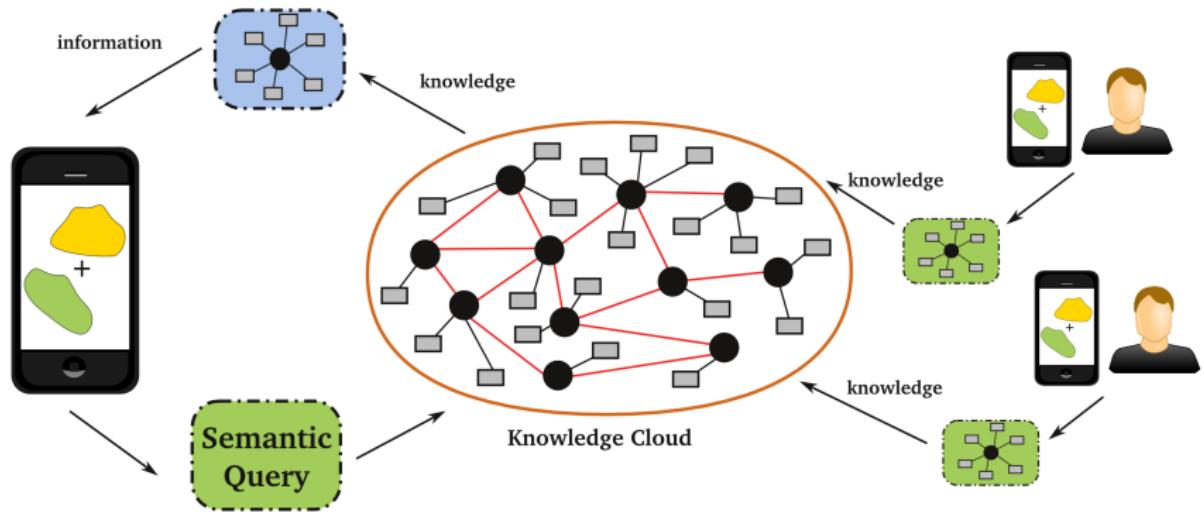
# Intelligent user interfaces



## 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

## Engineering of Intelligent Systems

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

## Ambient Intelligence and Machine Learning

- You can continue your work later for your bachelor project
- You can get a better grade if you currently attend subject that somehow meets with the chosen topic

## Business Rules

- You can continue your work later for your bachelor project
- You can be employed as a full time research assistant in Prosecco project

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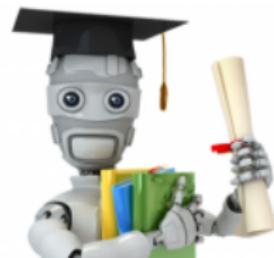
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## What is it about?

- Collect data from mobile device (GPS, accelerometer, magnetometer, WiFi, Bluetooth, etc)
- Implement Machine learning algorithms to classify this data



## Where to search for help

- Machine Learning course on Coursera: <http://coursera.org>
- <http://www.comp.lancs.ac.uk/~kristof/research/thesis/>
- Szymon Bobek [szymon.bobek@agh.edu.pl]

## Expected Results

- Working application that collects sensor data
- At least one machine learning algorithm that tries to classify this data
- Report

## What is it about?

- Find out if there are some rule-based frameworks for Android
- Implement an intelligent interface, that will adapt to the context (for instance GPS location) based on the rule-based model



## Where to search for help

- Szymon Bobek [szymon.bobek@agh.edu.pl]
- Weronika T. Adrian [wta@agh.edu.pl]
- [http://www.scis.ulster.ac.uk/~kevin/top\\_ambi.htm](http://www.scis.ulster.ac.uk/~kevin/top_ambi.htm)

## Expected Results

- Working application
- Report

## What is it about?

- Take one of our devices: Smartphone, Tablet, Augmented Reality Glasses, Smarboard
- Go through SDK
- Impress us! ;)



## Where to search for help

- Szymon Bobek [szymon.bobek@agh.edu.pl]

## Expected Results

- Working applications on selected device
- Simple How-To that will describe how to implement what you did

## What is it about?

- Go through tools/prototypes of context-aware applications for Ambient Assisted Living area
- Write the report about possible solutions (What is, what is missing)



## Where to search for help

- Weronika T. Adrian [wta@agh.edu.pl]
- Szymon Bobek [szymon.bobek@agh.edu.pl]
- [http://www.scis.ulster.ac.uk/~kevin/top\\_aal.htm](http://www.scis.ulster.ac.uk/~kevin/top_aal.htm)

## Expected Results

- Report: survey and comparison of tools/methods
  - repository of related papers, links, instructions

## What is it about?

- enhancement of the Loki (semantic wiki) system
- integration of plugins for Dokuwiki
  - semantics,
  - modelling Business Processes



## Where to search for help

- Weronika T. Adrian [wta@agh.edu.pl]
- Krzysztof Kluza [kluza@agh.edu.pl]
- <http://loki.ia.agh.edu.pl>

## Expected Results

- Semantic wiki system supporting business processes

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## O co chodzi?

- Opracowanie/opisanie procesu instalacji pakietu Drools w wersji 5.5.0:
  - Expert
  - Guvnor
  - Fusion
  - Kompletny moduł jBPMN: konsola, user task, etc.
- Pracujemy na Debianie :-)
- Zamodelowanie prostego Proof of Concept - potwierdzenie poprawności instalacji:
  - Model procesowo-regułowy.
  - Integracja procesów z regułami.
- Spisanie zależności systemowych.
- Identyfikacja problemów.

## Gdzie szukac pomocy?

- Krzysztof Kaczor [kk@agh.edu.pl]
- Dokumentacja: <http://www.jboss.org/drools/documentation>.

## O co chodzi?

- Opracowanie prototypu integracji edytora HQEd z edytorem Oryx.
- Implementacja obsługi protokołu - protokół jest gotowy i częściowo wspierany.

## Gdzie szukac pomocy?

- Krzysztof Kaczor [kk@agh.edu.pl]
- [http://ai.ia.agh.edu.pl/wiki/pl:dydaktyka:mgr:2011\\_bpeditor:start](http://ai.ia.agh.edu.pl/wiki/pl:dydaktyka:mgr:2011_bpeditor:start)
- <http://ai.ia.agh.edu.pl/wiki/hekate:hqed>

## O co chodzi?

- Zapoznanie się z edytorem.
- Uzupełnienie (stworzenie) zawartości pomocy dla edytora HQEd.
- Gotowy framework - brakuje zawartości  
(<http://ai.ia.agh.edu.pl/wiki/hekatedev:hqed:dev3:start>).

## Gdzie szukac pomocy?

- Krzysztof Kaczor [kk@agh.edu.pl]

## O co chodzi?

- Wypracowanie skutecznej metody budowania binarnych pakietów instalacyjnych programów HQEd, HeART i HJEd.
- Okresowe automatyczne budowanie - snapshots.
- Wersje standalone - statyczne budowanie w Qt.

Wersje instalacyjne mają być dostępne w na platformę GNU/Linux x86 (punkt odniesienia to Debian/GNU i Ubuntu) oraz Win32.

## Gdzie szukac pomocy?

- Krzysztof Kaczor [kk@agh.edu.pl]
- Szymon Bobek [szymon.bobek@agh.edu.pl]

## O co chodzi?

- Dla tych którzy nie chcą programować.
- Prace o charakterze koncepcyjnym.
- Przegląd różnych narzędzi, technologii, formalizmów, itp.

## Gdzie szukac informacji?

- Krzysztof Kaczor [kk@agh.edu.pl]

## Oczekiwane rezultaty

- Stworzenie krótkiego raportu z wykonanego zadania.

## O co chodzi?

- Stworzenie interfejsu graficznego dla silnika wnioskującego HeaRT
- interfejs komunikuje się z silnikiem po TCP/IP
- Preferowany język implementacji GUI - Java

## Gdzie szukac pomocy?

- Szymon Bobek [szymon.bobek@agh.edu.pl]
- [http://ai.ia.agh.edu.pl/wiki/student:spring\\_of\\_code\\_2012](http://ai.ia.agh.edu.pl/wiki/student:spring_of_code_2012)

# Integracja narzędzi do modelowania/uruchamiania procesów

## O co chodzi?

- Rozwinięcia systemu BPWiki pod kątem użycia go do inżynierii procesów biznesowych:
- Integracja systemu BPWiki z narzędziami do metryk. Zintegrowanie Dokuwiki poszerzonym o plugi do BPMN z narzędziem do metryk (udostępnionym narzędziem w Javie (lub) stworzenie pluginu do metryk bazującego na pluginie BPMN).
- Integracja systemu BPWiki z narzędziami do reguł biznesowych. Wprowadzenie możliwości dodawania linków do tabel/plików z regułami do zadań regułowych oraz możliwości eksportu modelu procesu wraz z regułami.
- Rozszerzenie integracji narzędzia Oryx z HQEdem o modelowanie tabel XTT2 w Oryxie.

## Gdzie szukac pomocy?

- Krzysztof Kluza [kluza@agh.edu.pl]

# Modelowanie procesów i rozbudowa aplikacji Activiti

## O co chodzi?

- Uruchomienie z poziomu Activiti reguł w narzędziu HeaRT.
- Rozszerzenie Activiti Explorera o możliwość dodawania plików XTT2 i wiązania tabel/plików z zadaniami regułowymi.

## Gdzie szukac pomocy?

- Krzysztof Kluza [kluza@agh.edu.pl]

## O co chodzi?

- Instalacja wybranych narzędzi do weryfikacji procesów biznesowych oraz przygotowanie howto/tutorialu do nich.
- Instalacja wybranych narzędzi do symulacji procesów biznesowych oraz przygotowanie howto/tutorialu do nich.

## Gdzie szukac pomocy?

- Krzysztof Kluza [kluza@agh.edu.pl]

# Opracowanie kompleksowych modeli procesów biznesowych

## O co chodzi?

- Opracowanie modeli procesów biznesowych (wraz z regułami) opisujących wybrane procesy biznesowe zachodzące na naszej uczelni oraz w stowarzyszeniu PSSI..

## Gdzie szukac pomocy?

- Krzysztof Kluza [kluza@agh.edu.pl]

# Rozbudowa narzędzia do metryk dla procesów biznesowych

## O co chodzi?

- Rozbudowa/Przebudowa narzędzia do metryk dla procesów biznesowych i dodanie możliwości liczenia metryk bazujących na zależnościach pomiędzy elementami i strukturze modelu. .

## Gdzie szukac pomocy?

- Krzysztof Kluza [kluza@agh.edu.pl]

# Thank you for your attention

Thank you for your attention!

Do you have any questions?

<http://geist.agh.edu.pl>

