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AfCAI
LUX
Loki
BIRAFFE3

GEIST Research Profile

Group for Engineering of Intelligent Systems Technologies (GEIST) was created in 2009 by Grzegorz J. Nalepa and Antoni Ligęza and a group of dynamic young researches. The research interests of the Group is located in the area of computer science and artificial intelligence. It is focused on the methods, and tools for developing and applying intelligent technologies and systems.

Areas

GEIST is mainly focused on the following *areas of development and applications* of intelligent technologies and systems:

1. **explainable AI (XAI), machine learning and data mining** including big data analysis in practical applications
2. **knowledge engineering** including semantic information processing, knowledge graphs and semantic wikis
3. **business intelligence** including business process management
4. **ambient intelligence** including context-aware systems and augmented reality
5. **affective computing** with focus on personalized emotion processing in intelligent systems

Methods

We use and develop specific *methods and tools* such as for:

- knowledge representation and reasoning (KRR),
- knowledge engineering and management,
- rule-based systems,
- formal verification,
- knowledge graphs,
- semantic annotations and ontologies,
- semantic wikis,
- explainable artificial intelligence (XAI),
- machine learning (ML) techniques,

The expertise of the Group includes:

- design and implementation, as well as formal verification and analysis of knowledge-based systems,
- modelling and evaluation of business rules and processes,
- distributed and collaborative knowledge management with semantic wikis (see the Loki semantic wiki),
- development of knowledge graphs, including business solutions (e.g., in goods monitoring),

- context-aware applications,
- edge AI solutions,
- human-computer interaction (HCI),
- augmented reality (AR),
- affective computing (AfC),
- experimental studies, incl. experiments in game environments.
- gathering and processing of a variety of sensory data, such as accelerometer, temperature, physiological signals (ECG, EDA, EEG), and numerous domain-specific signals (e.g., related to coal mining or steel production),
- emotion detection and interpretation,
- design and development of interfaces with the use of mobile applications, speech, augmented reality, controllers, knowledge graphs, and others,
- designing experimental research in a game-based environment (see the BIRAFFE series of experiments).

Contacts

Finally the group is active in the area *international collaboration* for both research and teaching:

- international consortia under CHIST-ERA programme: PACMEL, XPM
- scientific collaboration with Universities of Wuerzburg, Kassel, Siegen, Almeria, Murcia, Halmstad, and Politecnica de Madrid
- teaching collaboration in the scope of the Erasmus LPP
- participation of group members in the Organizing Committees of international conferences and workshops, including PRAXAI, SEDAMI, AfCAI, KESE, and number of Program Committees, see here for more details
- see also the AfCAI community we created

We are looking for partners, and projects – contact us!

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