

Call 2014 Draft Topics & Keywords

In the **Call 2014**, to be published in October, two new and hot topics are addressed, namely *Resilient Trustworthy Cyber-Physical Systems* and *Human Language Understanding*.

The following topic keywords are given as illustration only. The [CHIST-ERA Conference 2014](#) ^[1] in Istanbul, June 17-18, brings together scientists and CHIST-ERA representatives in order to identify and formulate promising scientific and technological challenges at the frontier of research with a view to refine the scientific content of the call.

1. Resilient Trustworthy Cyber-Physical Systems

Cyber-physical systems (CPS) refer to novel hardware and software compositions creating smart, autonomously acting devices, enabling efficient end-to-end workflows and new forms of user-machine interaction. In manifold emerging application domains such as health care, traffic management or energy supply CPS carry a high potential for creating new markets and solutions to societal hazards, but impose highest requirements to quality in terms of resilience, safety, security and privacy. However, the heterogeneous, evolving and distributed nature of CPS bears major challenges to continuously assure these quality requirements employing state of the art methods and technologies. Foundational research efforts are needed to achieve a predictable quality level in an efficient, traceable and measurable way, coping efficiently with external and internal changes, supporting necessary transitions between mechanical, electrical and software engineering, as well as integrating management, design and deployment aspects.

Keywords:

- Security and safety requirements engineering
- Security infrastructures
- Intrusion detection
- Risk management
- Quality and risk models
- Model-based software and systems engineering
- Multi-level architectures
- Verification and validation
- Automated Testing
- Security testing
- Security and privacy protocols

- Certification processes

2. Human Language Understanding

Having a machine understand language like a human being can be considered as the epitome of Artificial Intelligence, as exemplified by the design of the Turing test. Even though the domain of automatic language processing has made steady progress over the last decades and some applications are out on the market, the machine is still far from reaching human performance. New approaches are needed, in particular to model high-level, semantic and pragmatic knowledge in a robust fashion. For that purpose, the machine learning approach which has proved very successful to train models from linguistic data should be extended to use more varied data, potentially covering the whole gamut of stimuli a human can learn from, in a much more multidisciplinary approach.

Keywords:

- Machine Reading, Question Answering, Dialog Systems, Automatic Speech Recognition, Optical Character and Handwriting Recognition, Opinion and Sentiment Analysis
- Machine Learning, Semi-Supervised Learning, Reinforcement Learning, Active Learning
- Semantic Analysis, Context Modelling, Concept Learning, Deep Learning
- Embodied intelligence, multimodal data processing, information fusion

Attachment	Size
 CHIST-ERA Call 2014 - Topics Flyer.pdf ^[2]	644.95 KB

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