



International

Innovation in Knowledge Based and Intelligent Engineering Systems



INVITED SESSION SUMMARY

Title of Session: **Immunity-Based Systems: Resilience with AI**

Name, Title and Affiliation of Chair:

Prof. Dr. Yoshiteru Ishida, Toyohashi University of Technology

Associate Prof. Dr. Takeshi Okamoto (Kanagawa Institute of Technology, Japan)

Details of Session (including aim and scope):

Immunity-based Systems (or Artificial Immune Systems) have been attracting a broad attention as an alternative avenue to build intelligent and life-like systems. Systems based on and inspired from the immune system indicate not only tolerant to noise by autonomous and distributed agents, but adaptive to dynamically changing environment. As a specific topic, we also focus on the application to resilient computing that can reduce or prevent damages in disaster situation, and the systems that utilize IoT and/or big data. Further, Science and Engineering related to collective intelligence such as formation robots and satellites are also called for.

This session calls for papers related to AI city, supporting a joint proposal by Japanese and German, including other Europeans, to HORIZON 2020 Programs:

- AI city
e.g. Information and response system for urban disaster, sustainable disaster risk prevention and daily benefit of satellites

In addition, this session calls for papers related to Immuno-engineering, Immuno-computing and Immuno-informatics. Specific topics of interest include but not limited to:

- Immuno-design
e.g. Designing Resilient Systems, Matching Based Design
- Immuno-modeling
e.g. Game theoretic approach, Cellular Automata, Asymmetric Interaction
- Immuno-engineering
e.g. Signal profiling, Sensor Systems, Applications to the Environmental Problems, Robust and adaptive design; Self-diagnosis, self-maintenance and self-organization; Security of information network
- Immuno Intelligence, Bio Intelligence and other Natural Intelligence
e.g. Artificial Intelligence and Natural Intelligence; Specific feature of Immuno Intelligence; Comparison of Immuno Intelligence to other Natural Intelligences; Bio Intelligence and Physical Intelligence; Degeneracy in Bio Intelligence and Physical Intelligence
- Immuno-informatics
e.g. Analysis and simulation of the immune system as a Complex System; Application to monitoring the immune system; Application to medication
- Immuno-computing
e.g. Computational approach to the Immunity-Based Systems; Learning and adaptive algorithms; Artificial Life; Multi-agent systems
- Disaster reduction, risk management and environment monitoring by Immunity-based Systems
- Immunity-based systems that utilize IoT and/or big data

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

Prof. Dr. Yoshiteru Ishida (TUT, Japan)

Associate Prof. Dr. Takeshi Okamoto (KAIT, Japan)

Website URL of Call for Papers (if any):

TBA

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