Preface

The continuous international efforts to enable everyday devices to participate in the emerging Internet of Things (IoT) ecosystem has led to an explosive increase in the number of smart devices that surround us. However, our capacity as humans to meaningfully process, manage, control, and interact with them is limited by human nature, our interests and our technical fluency. The coming new digital market envisions an ambient environment where the physical world, computer-based systems and humans converge and seamlessly interoperate, resulting in an improved social and economic marketplace.

Collectively, the public sector, industry, academia, end-users, SMEs, and large corporations constantly feed the, already, high expectations of IoT. Artificial Intelligence (AI) has the capacity to facilitate the anticipated socio-economic transformation caused by the proliferation of IoT through innovative algorithms and techniques.

The *Artificial Intelligence and Internet of Things* (AI-IoT) series of workshops aims at providing the ground for disseminating new and interesting ideas on how AI can make valuable contribution in solving problems that the IoT ecosystem faces. The virtualization of devices and smart systems, the discoverability and composition of services, the interoperability of services, the distribution of resources, the management and event recognition of big stream data, and the development of algorithms for edge and predictive analytics are only a few of the problems that look for intelligent human-centric solutions that could find application in smart cities, smart farming, transportation, health, smart grid, tourism, etc.

The second installment of the workshop – 2nd AI-IoT 2016 – was co-located with ECAI 2016 in The Hague, Netherlands and featured a keynote by Prof. Dirk Helbing from ETH Zurich, Switzerland, entitled "*Towards Smarter Societies*" and five accepted papers, resulting in an intriguing technical program. Papers accepted in the workshop gave special emphasis in AI-related topics such as:

- Machine learning
- AI planning
- Reasoning under uncertainty
- Personalization
- Classification
- Real-time event recognition
- Multi-agent systems

that have been explored in smart societies, tele-assistance, smart tourism, embedded sensor fusion, for activity recognition in surveillance and security systems, and for detecting treads and abnormal activities in maritime surveillance.

Specifically in this proceedings the contributions of the accepted papers are as follows. In the "*Third Generation Teleassistance: Intelligent Monitoring Makes*

the Difference", Rafael-Palou et al. propose an intelligent monitoring solution for elderly people, integrated in an IoT-based tele-assistance system, demonstrating how it contributes in offering enhanced support to both end-users and caregivers. Machine learning methods based on SVM are used for detecting interesting events and issuing alarms in case of an emergency. Results from deploying the system in real-life situations are presented. Marzal et al. in "*Temporal Goal Reasoning for Predictive Performance of a Tourist Application*", discuss a goal reasoning framework that identifies if the context information acquired from several external resources dictates a change in the execution of a temporal plan. TempLM, a temporal planner that uses temporal landmarks for planning with temporal deadlines, detects situations of future failures and opportunities in the plan execution. The capability of the planner to adapt to external events is showcased in a smart tourism scenario. Babli et al. in their paper entitled "*An Intelligent System for Smart Tourism Simulation in a Dynamic Environment*" present an AI planning-based system for the smart tourism domain, where the goal is to construct a personalized tourist agenda of places a tourist could visit according to his preferences. The system not only creates the agenda, but also monitors its execution in real-time through simulation. Emphasis is given in dynamically reacting to changes in the environment by adapting, if necessary, the tourist agenda, through reformulation of the planning problem, to reflect the new state of the environment in real-time. In "*Extending Naive Bayes with Precision-tunable Feature Variables for Resource-efficient Sensor Fusion*", Galindez Olascoaga et al. focus on the tradeoff between resource efficiency and inference accuracy, by tuning feature quality in sensing devices. An extension to the naive Bayes classifier is implemented and evaluated in sensor fusion tasks. The algorithm is capable of dynamically tuning feature precision as a function of the incoming data quality, the difficulty of the task and the resource availability. In the last paper, "*A Distributed Event Calculus for Event Recognition*", Mavrommatis et al. present a distributed approach for stream reasoning, called dRTEC, based on a dialect of event calculus. dRTEC employs the Apache Spark framework to perform scalable event recognition and detect significant patterns.

The organizers would like to thank the authors for submitting their work to the workshop, the members of the program committee for their valuable contribution in reviewing the papers and, of course, the numerous participants of the workshop.

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`Workshop site: http://2nd-ai-iot2016.iit.demokritos.gr/`