

Current Approaches in Applied Artificial Intelligence: The 2019 International Conference on Industrial, Engineering, and Other Applications of Applied Intelligent Systems

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■ *The 32nd meeting of the International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems was held July 9–11, 2019, in Graz, Austria. The conference focus for 2019 was on automated driving, autonomous systems, robotics, and AI in tourism.*

Since the very first meeting in 1988, the International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems has had an international focus, with meetings in Australia, Canada, China, Egypt, England, France, Germany, Hungary, Italy, Japan, the Netherlands, Poland, Scotland, South Korea, Spain, Taiwan, and the USA. For its 32nd meeting, the International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems came to Austria for the first time, welcoming researchers and practitioners in Graz, a United Nations Educational, Scientific and Cultural Organization city and the former cultural capital of Europe. The conference was held July 9–11, 2019 at the Graz University of Technology — the oldest technical university in Austria.

Sponsoring the International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems for 2019 was Graz University of Technology, the University of Klagenfurt, and the International Society of Applied Intelligence. The meeting was held in cooperation with the Association for the Advancement of Artificial Intelligence, the Special Interest Group on Artificial Intelligence/Association for Computing Machinery, and the Austrian Society of Artificial Intelligence.

The International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems 2019 continued a tradition, emphasizing applications of applied intelligent systems that can solve real-life problems in engineering, science, industry, automation and robotics, business and finance, medicine and biomedicine, bioinformatics, cyberspace, and human-machine interactions. For 2019, the conference's special focus was on automated driving, autonomous systems, robotics, and artificial intelligence (AI) in tourism.

The program committee comprised 87 international experts representing almost all fields of AI. The committee was composed of academic and industry experts from 24 different countries. The committee received 151 abstracts, of which 118 papers were selected for review. From these submissions, program committee members, along with 41 external reviewers, selected 41 full papers and 32 short papers. The acceptance rate for full papers was 34.75 percent. The authors of accepted papers came from 38 countries and four continents.

The accepted papers covered a variety of applied scientific fields where AI methods and tools are successfully deployed, including AI for estimation and prediction, applied neural networks, autonomous systems and automated driving, data science and security, decision support systems and recommender systems, fault detection and diagnosis, intelligent information storage and retrieval, intelligent systems in real-life applications, knowledge representation and reasoning, mobile and autonomous robotics, natural language processing and sentiment analysis, and optimization.

Accepted papers were presented by at least one of their authors in one of the 20 paper sessions of the technical program. Complementing the technical talks, the program was supplemented by an extensive welcome and multiple gala dinner events. Attendees were also welcomed officially by the mayor's office during the opening reception. For more details about the program, see <http://ieaaie2019.ist.tugraz.at/>.

Keynote Presentations

In addition to the 20 technical sessions, three key experts from academia and industry gave keynotes discussing recent results in respect to applying AI technology, as well as the current and future challenges that have to be tackled to successfully bring AI technology into practice.

Reiner John (Infineon, Germany) spoke of the need for AI methods and techniques in the automotive domain. In his talk, he focused on autonomous driving, highlighting the importance of safety, and discussed how carbon emissions can be reduced by deploying AI technology in this domain. In particular, he gave examples related to the propulsion system and its growing complexity. To be successful, one of the key points was that the deployed AI technology requires complementing certification procedures to assure that the final products meet safety and other requirements.

In her keynote on contributions of diagnostic reasoning to the general demand for AI in the industry, Louise Travé-Massuyès (Laboratory for Analysis and Architecture of Systems [Laboratoire d'Analyse et d'Architecture des Systèmes]-Centre National de la Recherche Scientifique) discussed the application of model-based reasoning to diagnosis, considering two different application domains. The first one was focused on the use of diagnostic reasoning based on discrete event systems for space missions, considering active diagnosis in particular. The underlying idea in active diagnosis is to plan for actions such as obtaining new measurements for distinguishing diagnosis candidates. The second domain was the manufacturing industry, where Louise Travé-Massuyès focused on predictive maintenance, showing corresponding solutions and the challenges we face in such applications.

In the final keynote, Dietmar Jannach from the University of Klagenfurt, Austria, spoke on challenges and recent advances in system-based recommendation. He discussed current results, challenges, and trends in the field of recommender systems, discussed the underlying problems, and presented the most recent empirical results regarding the performance of recommendation algorithms.

Best Paper Awards

The best paper award was presented to Kuruge Darshana Abeyrathna, Ole-Christoffer Granmo, Xuan Zhang, and Morten Goodwin for their paper A Scheme for Continuous Input to the Tsetlin Machine with Applications to Forecasting Disease Outbreaks. The best student paper was presented to Bogeun Jo, Kyungbae Park, and Sung Ho Ha, for their paper The BRAVO: A Framework of Building Reputation Analytics from Voice Online. Certificates of merit were also presented to Erlend Olsvik, Christian M. D. Trinh, Kristian Muri Knausgård, Arne Wiklund, Tonje Knutsen Sjørdalen, Alf Ring Kleiven, Lei Jiao, and Morten Goodwin for Biometric Fish Classification of Temperate Species Using Convolutional Neural Network with Squeeze-and-Excitation; Philippe Fournier-Viger, Peng Yang, Jerry Chun-Wei Lin, and Uday Kiran for Discovering Stable Periodic-Frequent Patterns in Transactional Data; Anton Borg, Martin Boldt, and Johan Svensson for Using Conformal Prediction for Multi-Label Document Classification in E-Mail Support Systems; and Ayman A. Atallah, Ghaith Bany Hamad, and Otmane Ait Mohamed for



Main Building of the Graz University of Technology.

Multipath Routing of Mixed-Critical Traffic in Time Sensitive Networks.

The authors of both best paper categories received a cash prize of 500 Euros (per paper). Funds were provided by Springer.

The proceedings of the conference, *Advances and Trends in Artificial Intelligence — From Theory to Practice, Proceedings of the 32nd International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems*, was published by Springer in their Lecture Notes in Artificial Intelligence series, volume 11606.

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