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Eugénio Oliveira · João Gama
Zita Vale · Henrique Lopes Cardoso (Eds.)


Progress in Artificial Intelligence


18th EPIA Conference
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Proceedings

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Preface

The EPIA Conference on Artificial Intelligence came back to Porto. EPIA's first edition, in 1985, followed by the 1993 and 2001 editions, already took place in this unique city.

Today, AI is experiencing a new age of social recognition as well as increasing ethical responsibility, which makes this event, in 2017, even more attractive and challenging.

The main goal of the EPIA conferences has always been to foster research, scientific knowledge exchange, and new insights in the AI scientific area. This is achieved through judicious presentations and critical discussions on selected topics by, among others, researchers, practitioners, scientists, and engineers.

The 18th EPIA Conference on Artificial Intelligence (EPIA 2017) took place at the Faculty of Engineering of the University of Porto during September 5–8 (www.fe.up.pt/epia2017/).

This edition included several novelties. First, it was mandatory to include international AI community researchers, from different countries, in each track's Organizing Committee.

The international flavor of this EPIA edition was confirmed by the origin of the Program Committee (PC) members, coming from 42 different countries, and accepted paper authors, who belong to 17 different countries (Argentina, Austria, Brazil, Finland, France, Germany, Italy, The Netherlands, New Zealand, Poland, Portugal, Russia, South Africa, Spain, Turkey, USA, Ukraine).

Secondly, we promoted a journal special issue for papers specifically submitted to the journal (*New Generation Computing*, Special Issue on “Computational Models for Social and Technical Interactions”). The accepted papers were also presented orally during the conference.

EPIA 2017 encompassed a record of 16 tracks devoted to different topics, plus a doctoral symposium and a panel session on “Beneficial AI.” The selected tracks are: ABM4Crime – Agent-Based Modelling for Criminological Research, AICPDES – Artificial Intelligence in Cyber-Physical and Distributed Embedded Systems, AIG – Artificial Intelligence in Games, AIM – Artificial Intelligence in Medicine, AIPES – Artificial Intelligence in Power and Energy Systems, AITS – Artificial Intelligence in Transportation Systems, ALEA – Artificial Life and Evolutionary Algorithms, AmIA – Ambient Intelligence and Affective Environments, BAAI – Business Applications of Artificial Intelligence, IROBOT – Intelligent Robotics, KDBI – Knowledge Discovery and Business Intelligence, KRR – Knowledge Representation and Reasoning, MASTA – Multi-Agent Systems: Theory and Applications, SE4AIS – Software Engineering for Autonomous and Intelligent Systems, SSM – Social Simulation and Modelling, TeMA – Text Mining and Applications.

The invited speakers at EPIA 2017 were Francesco Bonchi, Research Leader at the ISI Foundation, Turin, Italy, with a talk on “Data Science”; Simon M. Lucas, from the

School of Computer Science and Electronic Engineering, University of Essex, with a talk on “AI and Games”; and Philipp Slusallek, from the German Research Center for Artificial Intelligence (DFKI), Germany, with a talk on “Agents and Simulated Reality”.

There were 177 paper submissions to the thematic tracks, plus another 20 to the special session on “Business Applications of Artificial Intelligence” open to students and industry and to the doctoral symposium. The 18th EPIA also accommodated two AI-related competitions (Geometric Friends Game AI Competition and Discovery Challenge).

The papers acceptance rate was circa 38% which means that 71 (almost all full papers) out of 177 papers are published in these proceedings, plus six out of 26 in the journal special issue.

All the papers were carefully revised and the track organizing chairs, together with their respective Program Committee members, have to be praised for their hard work on scientific reviewing.

Thanks are also due to the supporting organizations (University of Porto, Faculty of Engineering of the University of Porto and Informatics Engineering Department) and, finally, the conference sponsors, starting with SISCOG, our main sponsor to whom we sincerely address our thanks, but also ShelfAI, MASDIMA, LTP, and DevScope. Our colleagues of the Organizing Committee, Ana Paula Rocha and Goretí Marreiros, were also crucial for the successful realization of EPIA 2017.

Thank you all.

June 2017

Eugénio Oliveira
Henrique Lopes Cardoso
João Gama
Zita Vale

Panel Session on Beneficial AI @EPIA2017 Porto, September 5, 2017

Members of the panel:

- Cristiano Castelfranchi (Italian National Research Council and University of Siena, Italy)
- Ernesto Costa (Universidade de Coimbra, Portugal)
- Luís Sarmento (TonicApp, Portugal, former applied Scientist at Amazon)
- Philipp Slusallek (DFKI, Germany)
- Simon M. Lucas (University of Essex, UK)
- Eugénio Oliveira (Universidade do Porto, Portugal) (Moderator)

Moderator: What do I mean by beneficial AI?

Besides the obvious, pointing to the production of new technology at the service of new businesses, corporations, armies, or governments, I am more in favor that beneficial AI should be measured by how much it complies with human rights and harmonious progress of humanity as a whole.

It is an accepted fact that the most relevant outcomes of civilization derive from the fair use of intelligence. How can we improve and enlarge those benefits, through AI-based systems?

Q1: Can AI continue to provide a new revolutionary conceptual and formal instrument for understanding and modeling (human) mind, intelligence, intentional behavior, emotions, communication, social structures and their dynamics? Can AI develop a theory of cognitive and social phenomena of its own, not imported from social sciences?

Q2: About the possibility of the so-called strong AI. Is consciousness a possible state for an AI-based system to achieve?

Q3: Considering purposeful systems that truly integrate humans and machines, would it be possible to formulate general rules for humans to retain control?

Organization

The 18th EPIA Conference on Artificial Intelligence (EPIA 2017) was co-organized by the Artificial Intelligence and Computer Science Laboratory (LIACC) of the University of Porto (UP), the Laboratory of Artificial Intelligence and Decision Support (LIAAD) of INESC-TEC, and the Intelligent Engineering and Computing for Advanced Innovation and Development Research Group (GECAD) of the Institute of Engineering, Polytechnic of Porto (ISEP/IPP).

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