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*IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.*

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

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Ilias Maglogiannis · John Macintyre ·  
Lazaros Iliadis (Eds.)

# Artificial Intelligence Applications and Innovations

AIAI 2021 IFIP WG 12.5  
International Workshops

5G-PINE 2021, AI-BIO 2021, DAAI 2021,  
DARE 2021, EEAI 2021, and MHDW 2021  
Hersonissos, Crete, Greece, June 25–27, 2021  
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# Preface

Artificial Intelligence (AI) continues to advance, following extreme development rhythms in the new era of the 21st century. It has already made its way into our daily lives in various forms. It is estimated that more than 80 billion USD have been invested by car industries for the design and development of autonomous self-driving vehicles. AI technologies like *Google Duplex* are accomplishing real-world conversations and arrangements with humans, using *Deep Neural Networks* (e.g., Google voice search, Wavenet). It is estimated by the International Data Corporation, a global provider of market intelligence, that investments in AI business globally will reach up to 110 billion USD by 2024. AI is a major part of the Fourth Industrial Revolution, together with other technologies like the *Internet of Things*, *Genetic Engineering*, *Quantum Computing*, and its impact in the evolution of our post-modern societies in various domains is huge and growing. On the other hand, there are major areas of ethical concern for our societies, namely privacy, surveillance, bias-discrimination, and elimination of entire job categories. Moreover, serious questions arise on the superiority and indispensability of human judgment on important aspect of life. In other words, “Can smart machines outthink our human judgment?”.

The *17th International Conference on Artificial Intelligence Applications and Innovations* (AIAI 2021) offered insight into all timely challenges related to technical, legal, and ethical aspects of intelligent systems and their applications. New algorithms and potential prototypes employed in diverse domains were introduced.

AIAI is a mature international scientific conference series that has been held all over the world and it is well established in the scientific area of AI. Its history is long and very successful, following and propagating the evolution of intelligent systems.

The first event was organized in Toulouse, France, in 2004. Since then, it has had a continuous and dynamic presence as a major global, but mainly European, scientific event. It has been organized in China, Greece, Cyprus, Australia, and France. It has always been technically supported by the International Federation for Information Processing (IFIP) and more specifically by Working Group 12.5, which is interested in AI applications.

Following tradition, this Springer volume belongs to the IFIP AICT series. It contains the original research papers that were accepted, following a peer review process, for oral presentation at six (out of eight workshops) organized as satellite events under the framework of AIAI 2021:

- The 10th Mining Humanistic Data Workshop (MHDW)
- The 6th Workshop on 5G-Putting Intelligence to the Network Edge (5G-PINE 2021)
- The 1st Workshop on Defense Applications of AI (DAAI 2021)
- The 1st Workshop on Energy Efficiency and Artificial Intelligence (EEAI 2021)
- The 1st Workshop on Distributed AI for Resource-Constrained Platforms (DARE 2021)

- The 1st Workshop on Artificial Intelligence in Biomedical Engineering and Informatics (AI-BIO 2021)

In addition, this volume contains the abstracts of the presentations given by the invited speakers at the 1st Workshop on AI and Ethics (AIETH 2021), coordinated by Professor John Macintyre, University of Sunderland, UK.

The workshops were held during June 25–27, 2021, in Greece. The diverse nature of papers presented demonstrates the vitality of AI algorithms and approaches. It certainly proves the very wide range of AI applications and it promotes the timely advances in this area, in both theory and applications.

The response of the international scientific community to the AIAI 2021 workshops call for papers was more than satisfactory, with 72 papers initially submitted. All papers were peer reviewed by at least two independent academic referees. Where needed, a third referee was consulted to resolve any potential conflicts. A total of 35 papers (48.61% of the submitted manuscripts) were accepted to be published as full papers (12 pages long) in the proceedings. Owing to the high quality of the submissions, the Program Committees of the workshops decided that they should accept 5 more papers to be published as short papers (10 pages long).

June 2021

Ilias Maglogiannis  
Lazaros Iliadis  
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