

Preface of the Fourth Italian Workshop on Artificial Intelligence for an Ageing Society, AIxAS 2023

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Abstract

Increased life expectancy is an achievement of modern society in OECD countries (and recently in developing countries) thanks to technological progress in health, living places, and the quality of food. The aggregate consequence of the prolongation of the life-time span is the growth of an ageing society, as testified by several demographic studies. The study of the consequences of an ageing society on the future of social living has recently been considered by large world institutions (UN, EU), which addressed and designed programs for social and technological development taking into account the impact of the ageing society on the future of the world. Within this framework, topics such as “prolonging independent living,” “aging well,” or “social inclusion” are increasingly becoming more and more relevant. Several initiatives all over the world took care of these aspects, focusing on the problem of developing a new generation of innovative technologies to face an aging society and its growing needs. In this scenario, Artificial Intelligence (AI) methods and techniques have and will have a pivotal role, due to the advanced goals of the discipline and its inner cross-disciplinary attitude, to deliver innovative and impactful results and related technologies. The development of AI-based solutions to support longevity to cope with the changes of aging and cognitive capacities represents one of the most advanced ICT areas in the AI field. Robotics, Assistive Technology for Cognition, Sensor-based Monitoring Systems, Compensation Systems, Road Security, Continuous Learning and Navigation Supports for in-and-outdoor Systems are the fields where AI may challenge its solutions and contribute to innovative technological changes.

Preface


This volume contains the papers presented at AIxAS 2023, the fourth edition of the Italian Workshop on Artificial Intelligence for an Ageing Society (<http://aixas.it/>), held within the 22nd International Conference of the Italian Association for Artificial Intelligence (AIxIA 2023), on November 6th–9th, 2023. The aim of this series of workshops is to bring together researchers interested in different aspects of Artificial Intelligence in an Ageing Society. The working group “Artificial Intelligence for an Ageing Society” has previously organized several Workshops on Technological Challenges and Scenarios for the Ageing Society in Brescia, Palermo, Torino, Genoa, Bari, Trento, Rende, and Udine to discuss about technological roles and opportunities

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for Artificial Intelligence in the Ageing Society domain. Capitalizing from these activities, the group is establishing a stable forum on the topic and organized the this workshop with the goal of collecting contributions, ideas and new scientific and technological scenarios, as well as to discuss and disseminate results on Artificial Intelligence for an Ageing Society. Artificial intelligence (AI) methods and techniques have and will have a pivotal role, due to the advanced goals of the discipline and its inner cross-disciplinary attitude, in order to deliver innovative and impacting results and related technologies. The development of new AI-based solutions to support and help older adults, as well as those close to them, to cope with the changes of ageing and cognitive decline represents one of the most advanced ICT areas in the AI field. Nevertheless, facing the problems of an ageing society requires a crossdisciplinary approach, too. For this reason, the transition from a workshop focused on Artificial Intelligence for Ambient Assisted Living, as in previous years, to a more pervasive workshop on Artificial Intelligence for an Ageing Society became urgent to better reflect the multifactorial nature of aging process and the multidisciplinary efforts needed to face with it. Each paper was reviewed by members of the Program Committee of the Workshop, and based on their recommendations, 11 documents have been selected for presentation at the AIxAS 2023 workshop, among them 8 are published as regular papers, 2 as short ones. In addition, the workshop was enriched by the valuable participation of Marco Albertini as invited speaker. We sincerely thank all the members of the AIxAS Program Committee for their effort in the review process that was fundamental for maintaining the high scientific level of the workshop. We thank the AIxIA council, who trusted us to organize AIxAS 2023, and all the researchers of the AI community who supported this event by submitting their work and actively participated to the discussion.

December 2023

Francesca Gasparini, Francesca Fracasso, and Frida Milella

Workshop chairs

General Chairs

- Stefania Bandini (LINTAR – DISCo, University of Milano-Bicocca, Milan, Italy)
- Luigia Carlucci Aiello (Sapienza University of Rome, Rome, Italy)
- Gabriella Cortellessa (National Research Council of Italy, Institute of Cognitive Sciences and Technologies, CNR-ISTC, Rome, Italy)

Organizing Chairs

- Francesca Gasparini (MMSP-DISCo, University of Milano-Bicocca, Italy)
- Francesca Fracasso (National Research Council of Italy, Institute of Cognitive Sciences and Technologies, CNR-ISTC, Rome, Italy)
- Frida Milella (LINTAR – DISCo, University of Milano-Bicocca, Milan, Italy)

Program Committee

The AIxAS workshop chairs would like to thank all the Program Committee members for their reviewing and dissemination help:

- Flavio Soares Correa Da Silvas (University of São Paulo, Brazil)
- Riccardo De Benedictis (ISTC-CNR, Roma, Italy)
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- Stefano Ferilli (Università di Bari, Italy)
- Amedeo Cesta (ISTC-CNR, Roma, Italy)
- Rocco Oliveto (Università degli Studi del Molise, Italy)

Table of contents

Invited speaker

Marco Albertini

The potential for AI to the monitoring and support for caregivers: an urgent tech-social challenge.

List of papers

- Acceptability and clinical usefulness of a telemonitoring and telerehabilitation system in people with Parkinson's Disease in different disease stages: preliminary findings from the RAPIDO study.
Antonia Antonello, Antonio Sabatelli, Simone Valenti, Lucia Pepa, Luca Spalazzi, Elisa Andrenelli, Silvia Vada, Marianna Capecci, Michele Tinazzi, Gianmatteo Farabolini, Marialuisa Gandolfi, Giulia Bonardi, Maria Gabriella Ceravolo and Nicolò Baldini.
- How Artificial Intelligence can support informal caregivers in their caring duties to elderly? A systematic review of the literature.
Frida Milella, Davide Donato Russo and Stefania Bandini
- A Holistic System for Fostering Active Aging: The D3A Project.
Antonella Cascitelli, Patrizia Gabrieli, Rocco Oliveto, Daniela Scognamiglio and Jonathan Simeone
- Fatigue Estimation through Multimodal Data Retrieved from a Commercial Wearable Device.
Andrea Caroppo, Anna Maria Carluccio, Gabriele Rescio, Andrea Manni and Alessandro Leone

- Enhancing upper limb mobility through gamified tasks and Azure Kinect: a preliminary study in post-stroke subjects.
Claudia Ferraris, Gianluca Amprimo, Luca Vismara, Alessandro Mauro and Giuseppe Pettiti
- Biomarkers for Mixed Dementia: a hard bone to bite? Preliminary analyses and promising results for a debated topic.
Andrea Campagner, Lorenzo Famiglini, Beatrice Arosio, Paolo Rossi, Giorgio Annoni and Federico Cabitza
- Exploratory analysis of longitudinal data of patients with dementia through unsupervised techniques.
Patrizia Ribino, Claudia Di Napoli, Giovanni Paragliola, Luca Serino, Francesca Gasparini and Davide Chicco
- Privacy-Preserving Federated Learning for In-home Monitoring of Elderly with Wearable Biometric Sensors.
Mario Bochicchio and Sileshi Nibret Zeleke
- An Artificial Intelligence approach to predict multidimensional poverty of older people from unlabelled data
Lorenzo Olearo, Fabio D'Adda, Enza Messina, Marco Cremaschi, Stefania Bandini and Francesca Gasparini
- A computational framework for speech emotion recognition in case of multisource data.
Alessandra Grossi, Giorgio Fratti and Francesca Gasparini