Call for Chapters

Distributed AI in the Modern World

Technical and Social Aspects of Interacting Intelligent Agents

To all prospective contributors

We are in the process of editing a contributed book to be published by Elsevier, Inc., entitled *Distributed AI in the Modern World – Technical and Social Aspects of Interacting Intelligent Agents*.

This book aims to present different perspectives on the various forms of distributed artificial intelligence (AI), which will be illustrated using practical use cases. Readers will be provided with an overview of the challenges brought by the interactions of artificially intelligent entities with other entities and their environment, and architecture level views on practical solutions to these challenges. In terms of the forms of AI, we look into machine learning used collaboratively in a network of agents, software agents using machine learning models, software agents working on the web and in socio-technical systems, and physical embodiment of AI. In terms of interaction, we look into interaction between agents in local networks, across the web, or with and within physical environments. While these interaction settings are very different, some challenges remain the same in the context of interactions – discoverability, availability, communication languages and protocols, and efficiency in transferring significant amounts of information.

The book will be organized in three parts.

- Part 1 deals with principles and methods for distributed machine learning, looking into challenges related to distributed, collaborative use and training of machine learning models. Topics include agent-based machine learning, federated learning, knowledge sharing for machine learning, edge AI, and the risks related to the distribution of artificial intelligence.
- Part 2 deals with tools that enable the deployment of distributed artificial intelligence and the combination of multi-agent systems with machine learning. Topics include frameworks for distributed machine learning, integrations between machine learning and agent-oriented software engineering, and deployment of entities in heterogeneous sociotechnical environments.
- Part 3 deals with the physical embodiment of artificial intelligence and the interaction of intelligent computing entities bound by their physical space, such as social robots, robot collectives, and ambient intelligence.

Contributions to this volume might include, but are not limited to, improvements to the state of the art in:

- Federated Learning
- Knowledge sharing in agent communities
- Distributed multi-agent learning

- Responsible Distributed Machine Learning
- Integration of machine learning models in agent-based applications
- Multi-agent system frameworks
- Web of things and autonomous agents
- Socio-technical networks and hyperagents
- Interactions in agent-based simulation
- Interaction in social humanoid robots
- Coordination of physical robots

Contributing to the book

If you wish to contribute, please send to andrei.olaru@upb.ro, by November 29, 2024, an abstract of between 1 and 2 pages, including six keywords, a brief bibliography (3-5 references), author names, corresponding author, and institutional affiliation. The abstract should demonstrate the advancement that your work brings to the state of the art in the context of this book. A quick confirmation will be sent for each submission.

Notifications will be sent to all authors as soon as the review process is concluded (tentative date December 15, 2024). Authors of approved abstracts will be asked to write chapters of up to 30 pages in Elsevier format [1], including references. The final submission deadline is March 15, 2025.

Important dates

Deadline for abstract submission: **November 29, 2024**

Abstract selection notification: December 15, 2024 (tentative)

Complete chapter submission: **March 15, 2025**

Editors

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[1] https://www.elsevier.com/researcher/author/policies-and-guidelines