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Database and Expert Systems Applications - DEXA 2025 Workshops

AISys and AI4IP
Bangkok, Thailand, August 25–27, 2025
Proceedings

Springer

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Preface

Welcome to the Proceedings of the DEXA 2025 Workshops. This year, we hosted two workshops: the 5th International Workshop on AI System Engineering: Math, Modelling and Software (AISys 2025) and the 1st International Workshop on Optimisation of Industrial Production with AI Algorithms (AI4IP). These events took place from August 25–27, 2025 in Bangkok, Thailand.

This compilation of papers and presentations represents a convergence of cutting-edge research, interdisciplinary collaboration, industrial application of algorithms and methods, and innovative solutions at the forefront of science and technology.

AISys 2025 focused on the foundational aspects of trustworthy AI systems. The workshop brought together scientists from artificial intelligence, systems engineering, applied mathematics, and software architecture to explore the foundational and practical challenges of building robust, scalable, and trustworthy AI systems. This workshop also addressed the ethical dimensions of AI systems, with particular attention to compliance challenges arising from emerging regulatory frameworks such as the European AI Act. The contributions presented in this workshop explore key issues including the trustworthiness of AI systems, risk mitigation strategies for large language model (LLM) outputs, and the algorithmic and architectural challenges encountered in the development and deployment of complex AI systems. Together, these papers provide valuable insights into the intersection of ethical principles, regulatory demands, and technical implementation.

AI4IP 2025 was initiated by a group of scientists working in the very fast-growing field of AI algorithms applied to manufacturing processes. Today's production lines and assembly workflows are characterized by complex interdependencies and a high degree of automation. Each step in the process is capable of generating substantial volumes of data, thanks to the widespread use of advanced sensor technologies. Leveraging this data through intelligent algorithms is central to the realization of smart, adaptive, and efficient production systems. The contributions presented in this workshop address the design and application of effective optimization algorithms for assembly processes, the acquisition and interpretation of sensor data, and the use of intelligent methods to analyze complex production information in modern smart manufacturing environments. Key themes addressed by these papers include data acquisition strategies, algorithmic efficiency, real-time decision-making, and the integration of AI into existing production infrastructures. The goal is not only to enhance productivity and quality but also to support more flexible, sustainable, and resilient manufacturing systems. In addition to addressing algorithmic and data science challenges, also practical experiences in the design and implementation of robotic systems are shown, highlighting the interplay between AI algorithms and physical automation in real-world industrial settings. A common theme across all accepted papers is a strong emphasis on practical implementation and measurable benefits in addressing today's key challenges in industrial production.

The two workshops attracted 23 submissions, from which only 11 papers were accepted after a rigorous peer-review process, ensuring the highest standards of quality and relevance to the DEXA theme.

We extend our deepest gratitude to the authors, reviewers, and organizers whose dedication and expertise made these workshops possible. Their collective efforts ensured that the knowledge shared here is of the highest quality and relevance.

As you engage with these proceedings, we hope you find inspiration, fresh ideas, and valuable insights that will enrich your work and contribute meaningfully to the ongoing advancement of this dynamic and impactful field.

August 2025

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