Introduction to the Special Anniversary Issue on "AI in Slovenia"

Slovenian Artificial Intelligence Society (SLAIS) celebrated its 25th anniversary last year. Along with 40th anniversary of the Informatica journal and 20th Information Society conference, the idea of dedicating a special issue to commemorate these events was born. Informatica has long been a publication venue for Slovenian artificial intelligence (AI) research, one of the Information Society subconferences is dedicated to AI, and the best papers from it are traditionally published in the Informatica journal, so commemorating them jointly is very fitting. We decided to invite papers presenting current work of Slovenian AI researchers, as well as position papers providing a (historical) perspective on some AI topic.

The global research on AI has had several ups and downs through the history. It started in the 1950s with Alan Turing's seminal paper "Computing Machinery and Intelligence" and the Dartmouth conference. These events sparked a golden age of discovery, which ended in the so-called first AI winter in the 1970s. However, it was soon succeeded by another boom in the 1980s, spurred by the Japanese fifth-generation computer project. The second AI winter followed, caused by the perception that AI is not fulfilling its promise. After that, we have seen steady progress, and right now we are at another peak of success: AI is applied in all areas of life and business, with examples ranging from self-driving-cars to the games of go and chess.

As recorded by Marko Bohanec during his tenure as SLAIS chair, Slovenian AI research started in 1972, at the end of the initial golden age. It began at the Computer Science Department at Jožef Stefan Institute (JSI), and later expanded to the Faculty of Computer and Information Science (FRI) of the University of Ljubljana. Initially, AI research in Slovenia was concerned with heuristic search, including knowledge-based approaches to computer chess. The emphasis then gradually shifted and expanded to the areas of machine learning, knowledge representation, computer-aided multi-attribute decision making, qualitative reasoning and modelling, and combinatorial optimisation. This provided a solid basis for later application projects. In 1982, the development and implementation of AI tools started and soon resulted in numerous practical applications. Most of these applications were based on Assistant Professional, an inductive learning system, and DEX, a computer-aided decision making system. Later, the research encompassed practically all major areas of AI – basic and applied – some of which are sampled in the papers composing this special issue.

SLAIS was established in 1992, when Slovenian AI research was already quite extensive, as evidenced by having over 60 members one year after establishment. The membership later rose to a peak of 157. SLAIS is a member of the European Association for Artificial Intelligence (EurAI), and three of its members were elected EurAI fellows. SLAIS and Slovenian AI is in most respects firmly embedded in the European and global AI community, mainly through participation in international research projects beginning in 1990 with the first European Framework Programme. We are looking to continue along this path, as well as strengthen the collaboration and sense of community within Slovenia with efforts such as this special issue.

The first paper of the special issue is by Igor Kononenko, presenting early research on machine learning in Slovenia starting in 1982. It is followed by a paper of the AI pioneer Ivan Bratko on computer chess – a topic dating back to the very beginning of AI research and recently again brought to prominence by the success of AlphaZero. After these we have a range of papers on various topic representing most major Slovenian groups engaged in AI research. In addition to Igor Kononenko, the Laboratory for Cognitive Modelling at FRI is represented by Marko Robnik-Šikonja with a paper on explaining the predictions of machine-learning models. The AI Laboratory at FRI contributed a paper on argumentation in interactive machine learning by Martin Možina. From the AI Laboratory at JSI we have a paper on semantic annotation of documents by Janez Brank et al. The Department of Intelligent Systems at JSI is represented by two papers on AI applications in the health domain: on continuous blood pressure estimation from PPG signal by Gašper Slapničar et al., and on psychological arousal recognition from physiological signals by Martin Gjoreski et al. The Department of Knowledge Technologies at JSI is represented by three papers: on assessing the quality of feature rankings by Ivica Slavkov et al., on computational creativity by Senja Pollak et al., and on a related topic of creatively blending software components by Matej Martinc et al. Finally, we have a paper on text understanding by Jure Zupan, who does not belong to any established Slovenian AI group. We regret that we have not been able to include any paper from the Bioinformatics Laboratory at FRI or from the University of Maribor, but since we are confident in continued success of AI research in Slovenia, we trust there will be further opportunities for this.

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