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Preface to the Proceedings of SeLIE'22

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Self-learning systems are artificial agents able to learn through interactions with their surrounding environment or directly from collected data without explicit programming instructions. They are adaptive systems able to learn based on experience, make inferences from several signals, and then take action to adapt to the dynamically changing environment. Developing such systems requires the use of various AI techniques covering vast areas of machine learning, reinforcement learning, image processing, normative reasoning [1, 2, 3, 4, 5].

This edition of the workshop focuses on the design, implementation and exploitation of self-learning features in the field of Intelligent Environments and different contexts such as Healthcare, Robotics, Resource management [6, 7, 8, 9, 10, 11]. The workshop will represent an opportunity for academia and industry to debate the state of the art challenges and open issues. Four papers have been accepted for publication and presentation in this second edition of the workshop.

Martinelli et al. proposed a conceptual framework for addressing self-development to allow agents to act in an environment by acquiring knowledge on the causality relations of their individual and collective behaviour.

Naeem et al. proposed Reinforcement Learning-based approaches to improve human performance in task selection and management by incorporating several factors, such as task urgency, status, and importance. Five algorithms, such as Boltzman Sampling, Epsilon-decreasing, Random, Softmax, and Thompson Sampling, have been compared in a simulated task management environment of a coaching center. Results show shreds of evidence of the advantages of RL approaches in task allocation.

Shah et al. proposed an inverse reinforcement learning approach for finding optimal policies for dynamic treatment regimes. In the proposed approach, the reward function is derived from the demonstration of the expert's behaviour. Results show that existing RL models learn the environment more quickly with the clinically guided reward as compared to randomly defined rewards.

Ribino et al. proposed a multi-agent reinforcement learning approach to address the single-day elective surgery scheduling problem. Authors have modelled the problem as a Cooperative Markov Game where agents try to schedule as many as possible surgeries in a single working day by minimizing the makespan and the starting time of each scheduled surgery. Results show that the proposed approach outperforms other existing solutions in terms of make-span.

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