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Editorial

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Editorial

Nuno Sousa

Researcher, INESC-Coimbra, Coimbra, Portugal; Assistant Professor, Department of Sciences and Technology, Open University, Lisbon, Portugal (Orcid:0000-0002-2681-5035)

Seungjae Lee

Professor, Department of Transportation Engineering, University of Seoul, Seoul, Republic of Korea (Orcid:0000-0001-9081-2835)
(corresponding author: sjlee@uos.ac.kr)

Xu Zhang

Professor, School of Civil Engineering and Architecture, Henan University of Technology, Zheng Zhou, China; Chief Expert, Anhui Keli Information Industry Co. Ltd, Hefei, China

In 2016 Google DeepMind stormed the world with a deep neural network algorithm for playing the ancient game of Go (Silver *et al.*, 2016). Their *AlphaGo* computer program learned the game from self-play and was lined up against the world's best Go players, having taken down human resistance on what was the 'last board game standing', a breakthrough made possible in the wake of hardware developments of the last two decades. In fact, just before Go and other board games were mastered, applications of artificial intelligence and machine learning were being developed in many other fields of knowledge; well-known examples being image recognition (Le *et al.*, 2012; Taigman *et al.*, 2014; Szegedy *et al.*, 2015) and natural language processing (Hinton *et al.*, 2012; Sainath *et al.*, 2013; Haşim *et al.*, 2014).

Today, machine learning is seen as a promising set of techniques which enable tackling problems for which no conventional algorithms exist or are sufficiently effective, thus opening up vast avenues of research on topics up to now barely scratched. The complexity of today's urban environment and emergence of the ever-growing big data coming from intertwining between networks, buildings, and vehicles make machine learning and artificial intelligence an indispensable addition to the tools of the urban planner.

This issue of *Municipal Engineer* is directed at broadcasting state-of-the-art research in the application of machine learning and artificial intelligence to municipal engineering and decision-making. With a focus on transport engineering, this themed issue presents novel methods to help urban planners predict transport demand and deals with other traffic-related problems. In Park *et al.*, (2021) the important problem of how real-time information on what drivers actually do on any stretch of carriageway relates to accidents is investigated. Neural networks make an appearance in the next two articles, where predictions are made for taxi demand (Ku *et al.*, 2021), giving a glimpse on what mobility as a service might become, and highway travel times (Lee *et al.*, 2021), a key piece of information for long-distance commuting planning. The issue closes with two articles which make use of random forest algorithms.

In Seo *et al.*, (2021) demand forecast for bike-sharing systems is described, a topic whose importance is raising as authorities all around the world are taking significant steps to promote active mobility. Estimation of trip purpose from smart card data (Kim *et al.*, 2021) is the final contribution to the issue, an article which provides a helpful example case for public transport planners on how to combine big data with machine learning techniques and put them to productive use.

Machine Learning and Artificial Intelligence is a rapidly evolving field. As researchers improve their methods and computing power increases, the list of complex problems in municipal engineering that become tractable by these methods is also bound to increase. Expect *Municipal Engineer* to make a comeback to this theme in the (perhaps not-so-distant) future!

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