Deep Reinforcement Learning for wastewater treatment control: An application

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Advances in modelling and control have helped improved resilience and performance of environmental systems. Recently, Deep Reinforcement Learning has emerged as a promising technique in providing flexible and evolving strategies in various domains. We present an application of Deep Reinforcement Learning implemented on two controllers of a wastewater treatment model. In each of these controllers, a deep neural network was trained to predict the value function Q which represents the objective function of energy operation cost, effluent quality and environmental fines. The controllers learn to operate and adapt the treatment plant's controller setting under different weather and inflow conditions. The application demonstrates a potential for applying Deep Reinforcement Learning on environmental systems to improve management and control.