Synergy emergence in deep reinforcement motor learning

19 March 2020

In the current study, researchers from Tohoku University utilized two DRL algorithms on walking robotic agents known as HalfCheetah and FullCheetah. The two algorithms were TD3, a classical DRL, and SAC, a high-performing DRL.

The two robotic agents were tasked with running forward as far as possible within a given time. In total, the robotic agents completed 3 million steps. Synergy information was not used vis-à-vis the DRLs but the robotic agents demonstrated the emergence of motor synergy throughout their movements.

Mitsuhiro Hayashibe, Tohoku University professor and co-author of the study, notes, "We first confirmed in a quantitative way that motor synergy can emerge even in deep learning as humans do." Professor Hayashibe adds, "After employing deep learning, the robotic agents improved their motor performances while limiting energy consumption by employing motor synergy."

Going forward, the researchers aim to explore more task with different body models to further confirm their findings.


Provided by Tohoku University