International Session | International Session | [ES] E-2 Machine learning

# [2A4-E-2]Machine learning: method extensions

Chair: Junichiro Mori (The University of Tokyo)

Wed. Jun 5, 2019 3:20 PM - 5:00 PM  Room A (2F Main hall A)

The room is connected with B.

3:20 PM - 3:40 PM

## [2A4-E-2-01]Multi-carrier energy hub management through deep deterministic policy gradient over continuous action space

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Keywords:energy management, deep deterministic policy gradient , continuous action space

Multi-carrier energy hub has provided more flexibility for energy management systems. On the other hand, due to the mutual impact of different energy carriers in an energy hub's energy management becomes more challengeable. For energy management purpose Mathematic optimization tools are used, but real-time optimization challenges the optimal management. On the other hand, energy demand and supply are very changeable so optimization objectives may vary or more than one. For real-time management, changing environment and multi-objective options AI is purposed. In this work operation of multi-carrier energy hub optimization has been solved by executing a multiagent AI algorithm, which contain deep deterministic policy gradient(DDPG) algorithm. Research multi-agent simulation results show that AI agent can manage a balance between demand and supply, proper charging and discharging of storage agent to optimize energy hub cost. It also describes the price determination method by using AI, which is good for demand and supply management purpose for a market.