

# Modelling and AI for Integration of Cyber and Physical World

## Physical agent with skill-acquiring capability

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## Summary :

Motion data of operator is described perfectly by velocity, force, generalized transformation and time. At contact task, since such data also include physical information (environmental data) as well as motion data, both are obtained simultaneously by real haptic technology. In other words, data of skill motion for target environment are obtained from motion data. Skill motions have been considered as tacit knowledge which is not recorded or memorized artificially. If data mining technology based on AI is applied to such big data, a bettering process of motion skill would be visualized. Since physical model can be constructed from motion data, these two can be unified and implemented in physical agent. The customary motion by human operator/worker can be realized artificially. The bettering process of skill is also installed in such physical agent, then it acts like skilled operator/worker. In this research, the concrete physical agent is designed for screw driving at the first stage as a proof of concept. In the second stage, this research aims to install such system in the network system. IoA (Internet of Actions) will be designed for easy use of stored experience of skilled motion of human. Society 5.0 must have this kind of function based on this research.

