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Transfer of Knowledge in a Semantic Navigation Task Without the Accurate Map: Model-based Analysis of Knowledge Transfer

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Abstract

Humans can adapt their knowledge acquired for one problem to solve other problems of different problem domains. To seek for evidence of knowledge transfer, we investigated the human navigation behavior on the network of Wikipedia. We showed that the performance of human players is between that of the best navigator with full knowledge on the network structure of Wikipedia and of the poorest navigator with no knowledge on it. This suggests that human players transferred their knowledge on the nominal concepts onto the network structure of Wikipedia. Further, we conducted an analysis of the degree of confidence in decision making based on reinforcement learning. We found that human players might be very certain even about their first choice, from which we suspect that human players can solve the new problem by transferring their everyday knowledge successfully from the beginning and this can be a true power of knowledge transfer across problem domains.