

先端科学技術研究科 修士論文要旨

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論文題目	A Study on Node Selection Algorithm Based on Dueling Deep Q-Network Model in Unstable P2P Network Environments		
要旨			
<p>In recent years, Peer-to-Peer (P2P) file sharing has become a mainstream method for file sharing and is widely used over Wide Area Networks (WAN), with systems like BitTorrent being notable examples. However, rapid and unstable changes in WAN often result in underutilization of resource nodes. To address this issue, this study proposed a modified node selection algorithm based on a dueling Deep Q-Network (DQN) model, which considers real-time states of resource node utilization. The central server of the hybrid P2P file sharing system maintains node information and collects real-time states such as CPU, memory utilization, and network latency. The modified dueling DQN model ranks nodes by estimated download time, and data is downloaded from the node with the minimum download time. The results demonstrate that the proposed dueling DQN model reduces the download time by 20% compared to the random selection algorithm, and achieves almost equal download time with Tit-for-Tat (TFT) algorithm, while the proposed algorithm can adapt to the network environment faster than the TFT algorithm when the network latency fluctuates significantly.</p>			