

Title	複数の物理量を同時に管理する住環境制御に関する研究
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Living environment control that simultaneously manages multiple physical quantities

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The movement to utilize information and communication technology to control the living environment in the home is getting more and more active and the progress of IoT (Internet of Things) technology in recent years is making it a reality. There are many devices necessary for maintaining living environments, but since each device affects multiple living environment elements, control to maintain certain living environment elements has a positive influence on maintenance of other living environment elements. It does not always affect. Also, there is a problem that the appropriate living environment changes greatly depending on human activities, and living environment control by comprehensive device control taking these factors into consideration is required. Therefore, in this research, we aim to realize an appropriate living environment by controlling actuators that affect multiple living environment elements in Smart Home.

We create a model of the actual system in the virtual space and simulate how the results of the control can be obtained by controlling the most recent curtain, air conditioner, lighting, etc. in order to keep the illuminance and thermal environment properly. In addition, we optimize the operation method by carrying out simulation including user behavior prediction based on various parameter settings.

In this research, we select the control method necessary for maintaining multiple living environment elements. For that purpose, simulation was conducted to obtain the degree of influence when each device was operated. The Nash equilibrium is determined from the result and the value of the appropriate living environment element to determine the control method. By this research, comprehensive equipment control including equipment affecting different living environment elements becomes possible. As a future task, it is necessary to devise an optimization method accompanying increase of living environment elements and equipment.