

Title	レガシーデバイスを用いたホームネットワーク構築における機器の状態取得及び管理に関する研究
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# A state acquisition and state management method for home network systems with Legacy Device

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Recently, as the level of consumer electronics gets higher, the standards for network-based consumer electronic control systems and systems to connect the appliances to each other via network have been proposed, and some systems are already put to practical use. As middleware for the home network, there are HAVi (specification of the AV equipment for home network) and echonet (standard to control consumer electronic). However, a lot of traditional consumer electronics are existing in home now. Therefore, when the home network is constructed, it is necessary to replace the existing appliances that are compatible to the home network. Considering a price increase of the home electric appliances as they advance, it is expected that LegacyDevice (Home electric appliances without neither a network connection function and advanced information processing capability) will remain domestically in the future. In this research, the method of acquiring the state of LD(LegacyDevice) and the method of managing the state are built. After constructing the method of LD management and its requirements, LD home network is possible and become reasonably inexpensive.

In this research, first we proposed a method of controlling the equipment on the home network and the management method were examined. From the result of consideration, we proposed the way to construct a model for

equipments that function as a complex state machine which multiple sub state machines work together in union. So, we installed another sensor for state acquisition, which is mainly for the infrared ray signals capturing and the system recovery purpose.

In this research, catching an internal state of LD is achieved considering home electric appliances as a state machine (sensor that catches the infrared rays signal and the temperature and humidity, etc. that are the input to the state machine). And by installing the sensor in the system, information on the equipment is managed by the above-mentioned technique. First the sub state machine and its functions were explained. Next, the sensor used for the condition that the sub state machine maintains and the state acquisition is expressed, and the function that the sub state machine offers as an equipment resource is presented clearly. Events that would cause state shift could be remote control of LD and internal shift. Not like remote control by IR sensor, a state machine corresponds to the internal shift which spontaneously transit their own states. So, we installed a sensor that would capture the occurrence of their internal shift, and created a state table to illustrate state machines undergoing the shift. To solve the dependency this research constructs "Method of active acquisition of using the signal for identification", "Noise identification technique for catching the noise that is one example of the signal for identification", and "Automatic state table rewriting sequence".

it changes in the state to set the state of the sub state machine and it does for.

Such proposed home network system (HNS) is constructed with a processing unit and a sensor. The unit intensively process things done in the home network system, such as state managements and control of home electronics, and the sensor obtains conditions of each electronics. It has the feature as processing is collectively controlled with the unit, consistent information management control judges promptly and is low-cost.

Conclusively, we evaluated the validity of the LD home network system on the actual appliance, by implementing HNS and its correspondent applications with reference to the state acquisition approach that was discussed earlier in this study. It would be confirmed that the manage method consisted of the state acquisition approach and the internal shift is a valid if

the model of machine functions corresponds with the main machine. Also, accuracy of rewritten state tables is examined.

In the result of the evaluation, the state is unbridgeable gulf, and it is shown that the state machine keeps catching the state of a real machine based on control information from the sensor. As a result of the execution of the rewriting sequence, it is shown that the table is correctly rewritten, and "state table of each model that removes the dependency" is made. It is shown "Method of active acquisition" is to be able to identify the noise image of TV acquired by using an actual TV signal. In addition, the processing time for the state change and the control of the system was measured. As a result, the processing time for the sub state machine after receiving the signal with the sensor about 0.5ms-0.9ms ,and the processing unit took about 120ms so they work very fast and practicable performance. Moreover, the service offered by existing home networks and the proposal system is compared, and the domination of LD home network is shown. Finally, we considered accumulation of sensor information and competitive services that use the position of the sensor. These two are challenging tasks that lay ahead. Method using position of sensor ,and Competition of service, and this is future work