

# 論 文 要 旨

## Thesis Abstract

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<p>主論文題名 (Title)</p> <p>Learning and Executing Everyday Task from Instruction Manual and Human Demonstration</p>			
<p>内容の要旨 (Abstract)</p> <p>Robots have been widely used in the industrial applications where they are often pre-programmed in a well-defined and controlled environment. With the significant improvements of robotic technology nowadays, many special-purpose robots are entering human daily life. Autonomous robots are becoming more and more skilled in performing human-scale manipulation tasks. However, everyday tasks at home demand much knowledge a robot needs to have. The main challenges facing the robots are (1) what actions the robot needs to perform in the task; (2) how to perform each action; (3) perceiving objects (identification, pose, location) for manipulation actions.</p> <p>This dissertation presents a proposal for learning and executing everyday manipulation tasks which involve in operating objects or home appliances such as dispensing water from a water thermos pot, making a cup of coffee by a coffee maker, warming a lunch box by a microwave oven, ect. To solve this, firstly, the tasks are planned by the sequences of actions which are automatically acquired from instruction manual. Then, the knowledge about how to perform the action is obtained by learning from hand movement in human demonstration. A learning method of motion primitives from human hand movement using Dynamic Movement Primitives model has been implemented for generating movement trajectories adapted to new changes. In addition, this study also deployed the ability of perceiving objects for the robot to recognize object and estimate its 6-DOF pose which is used to manipulate that object. To confirm the proposal, the research in this dissertation takes into account an example scenario with the task 'dispensing water' from a water thermos pot.</p>			

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