

論文 / 著書情報
Article / Book Information

題目(和文)	柔らかいぬいぐるみロボットのための抱擁を中心とした社会的接触インタラクションの認識手法
Title(English)	Embrace-based Social Touch Recognition System for Soft-Stuffed Robots
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種別(和文)	要約
Type(English)	Outline

Thesis Outline

Chapter 1 presents the overall introduction of the thesis. This begins with the background of the study emphasizing the importance of social touch recognition and the lack of attention on embrace recognition. Next, the objective and the approach of this study are given with the aim to create an embrace-based social touch recognition system with soft-stuffed robots. Lastly, this chapter states the contributions and the outlines of the entire thesis.

Chapter 2 reviews the literatures which are related to the study. This includes four main topics consisting of robotic mediums, existing touch sensing technology, social touch recognition methods and unsupervised model selection approaches. In addition, it also provides the position of this study in view of the system design with regard to these four topics.

Chapter 3 details the overview of the system consisting of three main parts: types of social touch used in this study, the touch sensing system and the social touch recognition method. At the end, this chapter explains the approaches and measures for performance evaluation used in this study.

Chapter 4 presents the explanation and the experiment of the initial recognition approach which utilized an unsupervised two-layered hidden Markov models to learn and identify social touch which includes the embrace poses and the combination of embrace poses with touch gestures. The results from the experiment provides the reasons for separating into embrace and touch gesture recognition systems.

Chapter 5 details the embrace pose recognition method consisting of the explanation and the experiment of the preliminary method based on unsupervised learning approach and location-based features and the explanation and the evaluation of the final proposed embrace pose recognition method which was improved upon the preliminary approach. In addition, the assignment approach mapping between the cluster and the class labels and the proposed model selection guideline are introduced to help select the model. The last part of the chapter presents the experiment of applying the proposed embrace recognition method on different sensor configuration settings, and analyzes their effects on the embrace recognition performance.

Chapter 6 presents the explanation, the experiment and the evaluation of the touch gesture recognition based on supervised learning approach and dynamic features. In addition, this chapter applies the proposed touch gesture recognition method on different sensor configuration settings and analyzes the results and their effects on the touch gesture recognition performance.

Chapter 7 gives overall discussions regarding social touch interpretation,

effectiveness of sensor types and recognition methods with respect to touch interaction data. In addition, it also provides a conclusion to all studies within this dissertation and explanation about future works.