

Crowdsourcing Game Development for Collecting Benchmark Data of Facial Expression Recognition Systems

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Crowdsourcing is to dispatch a set of specific tasks to many online volunteers of different domains to perform the tasks. Usually the tasks are trivial and require a lot of human intervention, and furthermore, the tasks are hard to be replaced by computer programs. The advantage of crowdsourcing is three-fold: (1) the native ability of human can be used to perform the tasks; (2) the efficiency and quality can be improved; and (3) costs can be significantly reduced. In recent years, facial expression recognition has been heavily studied and most of the recognition systems can achieve a high precision rate. When developing an automatic expression recognition system, using benchmark data to train and test the system is always necessary. However, to manually classify facial expression pictures is very labor-expensive, time-consuming, and difficult to be standardized. Most of facial pictures in benchmark data are created by the research team, which may not be accepted by the public or other teams.

In this study, a crowdsourcing game is developed for collecting benchmark data of facial expression recognition systems. We also propose a mechanism that consists of two facial expression recognition systems, including a social system using crowdsourcing and an automatic system by computer programs. The social system captures facial pictures from Facebook. By playing the proposed game, online players will be encouraged to classify the facial pictures into four kinds of expressions, including happiness, sadness, surprise, and anger. Afterward, the expression pictures can be used to train and test the automatic system. The experimental results show that the expression pictures collected by our crowdsourcing game are with high validity and can be effectively used to train and test our automatic expression recognition system to achieve a high precision rate. Also, these expression pictures can be used as benchmark data for developing other facial expression recognition systems.