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Human Emotion Recognition Using Smart Sensors

A Thesis submitted in fulfilment of the
requirements for the degree of

Master of Engineering

in

Electronics and Communication Engineering

By

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February 2012

Abstract

Emotions play a vital role in people's everyday life. It is a mental state that does not arise through free will and is often accompanied by physiological changes. Therefore monitoring these changes is important as they are perceptions of emotional changes and can help in identifying matters of concern at an early stage before they become serious. Emotion recognition has become an important subject when it comes to human-machine interaction. Various methods have been used in the past to detect and evaluate human emotions. The most commonly used techniques include the use of textual information, facial expressions, speech, body gestures and physiological signals. In this project we have developed an emotion recognition system based on information provided by the physiological signals. These signals are obtained from a skin temperature sensor, a heart rate sensor, and a skin conductance sensor. The amplified and filtered signals from the sensors are input into the microcontroller where all the processing takes place. The microcontroller wirelessly transmits data to a computer where it is stored for data analyses and feature extraction for emotion recognition. The four basic emotions observed in this project are happy (excited), sad, angry and neutral (relaxed). The data has been collected from healthy individuals, including both male and female, with ages ranging from 18 to 72 years. K-means clustering algorithm has been used to cluster data into four groups (emotions). A graphical user interface (GUI) has been designed to communicate with the hardware as well as display real-time emotion(s) for the monitored period. The developed system has shown an overall emotion recognition rate of 86.25%.

Acknowledgements

First of all I would like to thank God for giving me the courage and strength to carry out my research. I am deeply indebted to Professor Subhas Mukhopadhyay for his continuous support, encouragement, valuable advice, technical help and supervision of my project. Without his help I wouldn't have achieved what I have achieved now.

I would like to acknowledge the help of Mr Ken Mercer, Mr Colin Plaw, Bruce Collins and Anthony Wade regarding technical matters and their invaluable advice to improve experimental works at the laboratory. I would also like to thank Clive Bardell for helping me build the heart rate sensor casing and Mike Lusby for IT support and advice. I would like to acknowledge the effort of Michelle Wagner who was responsible for the paper work throughout the course of project.

I would like to thank Mr. Nagender Suryadevara, PhD student, for his help with GUI development. I would also like to thank Mohd Amri, Mohd Syaifudin, and Anuroop Gaddam, PhD students, whom I turned to for quick technical advice. I also want to acknowledge the effort of all the individuals who participated in data collection for emotion evaluation and recognition. Special thanks to family and friends who were there for me and supported me where ever and whenever they could.

Finally I would like to thank my parents for their unconditional love and support. Thank you for all the sacrifices you have made to give me a better chance in life.

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