INTRODUCTION

Biomedical and Health Informatics (BIH) workshop 2011

Illhoi Yoo

The 2011 International Workshop on Biomedical and Health Informatics (BIH), chaired by Illhoi Yoo (University of Missouri, USA), was held in Atlanta, GA, USA, from November 13 to 14, 2011, in conjunction with the 2011 IEEE Conference on Bioinformatics and Biomedicine (BIBM). 14 workshops were held in conjunction with the BIBM conference. The BIH conference was the only 2-day workshop in the conference. The workshop received 40 submissions. Every paper was reviewed by at least two program committee members. The program committee and the workshop Chair selected 17 full papers and 10 short papers from them. Among the full papers, seven papers were invited to submit an extended version (at least 40 %) for publication in a special issue of the *Network Modeling Analysis in the Health Informatics and Bioinformatics* (NetMAHIB) journal. Extended manuscripts were reviewed, revised, and approved by reviewers. In the current special issue of the journal, five papers are presented (the remaining two papers will be published in a regular issue of the journal).

The first article, entitled "Monitoring Activity of Taking Medicine by Incorporating RFID and Video Analysis" by Hasanuzzaman et al., introduces a new framework to monitor medication intake for elderly people. The framework utilizes a video camera and radio frequency identification (RFID) sensors to monitor medication intake. RFID tags are attached on medicine bottles so that if a medicine bottle is taken away, RFID readers can detect and identify the tag attached on the bottle. A video camera (whose resolution is 320 × 240 pixels only) monitors the activity of taking medicine through activity detection. The experiment results demonstrate 100 % detection accuracy.

The second article, entitled "Finding Objects for Assisting Blind People" by Yi et al., introduces an object recognition system for blind people. The goal is to identify personal items such as keys, cups, sunglasses, etc., using camera-based network and matching-based recognition. Speeded-Up Robust Features (SURF) and Scale Invariant Feature Transform (SIFT) are used to extract distinctive invariant features. For the experiment (to test the prototype system) the authors used 10 daily necessities and took 10 pictures for each object (100 images in total). The detection accuracy ranges from 50 to 100 %. The SIFT-based method (74 % of accuracy) provides better performance than the SURF-based method (69 %).

The third article, entitled "Detecting Signage and Doors for Blind Navigation and Wayfinding" by Wang et al., proposes a novel framework to detect doors and signage for blind people. In order to recognize indoor signage, the proposed method first detects attended areas via saliency map based on color, intensity, and orientation, and then scaled patterns within attended areas using bipartite graph matching. It can handle multiple signage detection. To provide blind people with more information, it detects doors based on a geometric door frame model regardless of door appearance. The experiment results show that it achieves 86 and 81.6 % of accuracy for single-pattern and multi-pattern detections, respectively. For the door detection, it has 89.5 % of accuracy.

The fourth article, entitled "Towards an Environment for Data Mining based Analysis Processes in Bioinformatics & Personalized Medicine" by Wegener et al., presents an approach for the development of a data mining environment for personalized medicine. It discusses the needs and requirements when applying data mining to

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bioinformatics issues related to personalized medicine. In addition, the authors provide a case study on how to use data mining in a clinical trial scenario.

The fifth article, entitled "Application of Density Estimation Algorithms in Analyzing Co-morbidities of Migraine" by Yang et al., introduces a novel analysis procedure using density estimation to investigate the co-morbid associations between migraine and suspected diseases. The procedure consists of two steps. First, a kernel density estimation algorithm identifies interesting samples. Second, a density estimation algorithm is used to group the interesting samples providing a summary of the distribution. The clusters are: mental disorders; otolaryngology; musculoskeletal illnesses; metabolism and endocrinology;

and cardiovascular and neurological diseases; and gastroenterology and hepatology.

The papers in the special issue cover various important topics in the biomedical and health informatics field. We hope that the special issue will be of interest to researchers in the field. We are grateful to the program committee members of the workshop for their valuable comments and suggestions. The workshop and special issue could not have happened without them. The following is their alphabetical list: Chikashi Nobata, Dimitri Theodoratos, Hong Yu, HongFang Liu, Hua Xu, Hune Cho, HwanJo Yu, Isabel Segura Bedmar, Julio Facelli, Kayvan Najarian, Luke Huan, Matthew Scotch, Shamkant Navathe, Wook-Shin Han, Yang Huang, Yasunori Yamamoto, and Youngja Park.