Department of Mathematics, Statistics and Computer Science

COLLOQUIUM ANNOUNCEMENT

1:00 PM, Monday, November 23, 2015
Cudahy Hall, Room 401

Context-Aware Framework for Monitoring Complex Emotional States
Duc Do
MSCS Department, Marquette University

While instant emotion detection has gained much attention in both affective computing research and industry application, automatic recognition of subtle or abrupt mood changes is posed to be a more complex and challenging problem. Being able to extract meaningful information from a nuanced and noisy context and also having the capacity to continuously monitor complex emotional states will create a new type of affective computing application. One particular targeted user would be physicians or health-care providers who work with veterans suffering from mental health disorders such as PTSD and depression. Hypothesizing that multimodal information about a patient’s (veteran’s) continuous emotional states will facilitate the prediction of his abnormal behaviors, this talk has two folds. First, to provide a literature review of studies on the topics of affective detection and activity recognition, which are two factors that can be used to monitor continuous emotional states. Second, based on several preliminary study results, proposing a context-aware framework for real-time monitoring of continuous emotional states.

A Novel Light Weight Smartphone based Activity Recognition using Gaussian Mixture Models of Reconstructed Phase Spaces
Md Osman Gani
MSCS Department, Marquette University

Human activity recognition is an important area of research because it can be used in context-aware applications. With the pervasive use of smartphones, which contain numerous sensors, data for modeling human activity is readily available. This study presents a novel computationally efficient smartphone based human activity recognizer, based on dynamical systems and chaos theory. A reconstructed phase space is formed from accelerometer sensor data using time-delay embedding. A single accelerometer axis is used. A Gaussian mixture model is learned on the reconstructed phase space. A maximum likelihood classifier uses the Gaussian mixture model to classify ten different human activities and a baseline. One public and one collected dataset were used to validate the proposed approach. Data was collected from ten subjects. Out-of-sample experimental results show that the proposed approach is able to recognize human activities from smartphones one-axis raw accelerometer sensor data. The proposed approach achieved 100% accuracy for individual models across all activities and datasets.

1313 W. Wisconsin Avenue, Cudahy Hall, Room 401, Milwaukee, WI 53201-1881
For further information: see http://www.marquette.edu/mscs/resources-colloquium.shtml
or contact Dr. GG Hamedani #414-288-6348, gholamhoss.hamedani@marquette.edu
PRE-COLLOQUIUM REFRESHMENTS SERVED IN CUDAHY HALL, ROOM 342 AT 12:30 P.M.