This is Mohammad Ali Hussiny from Afghanistan, a lecturer at Faculty of Computer Science, Kabul University. I have completed MSc Computer Science from South Asian University, one of the best universities in SAARC Countries, New Delhi, India, from 2015 to 2017. I have done my Bachelor degree in BCA (Bachelor of Computer Applications) from Osmania University, Hyderabad, India, from 2012 to 2015.

Leading a research team at Kabul University for more than two years, our research lab has conducted several researches in the fields of Data mining, Big data analysis and Artificial intelligence under the titles of "**Separability of Human Voices by Clustering Statistical Pitch Parameters"," Dari handwriting recognition using neural network"," Mood Detection Using Sound" and "Question Generation System For Persian Language using NLP Techniques".**

Considering my research interest areas **Data mining, Big data analysis and an Artificial intelligence**. I have gone through your research profile, glancing at some of your recent papers, I have gone through your research profile and found out that your research expertises are well matched to my interest.

I am currently working on topic under title of Effective Somatosensory Interaction Techniques through Machine Learning and Gravitational Acceleration Data for Human Action Detection

Human Activity Recognition is an active research field in which methods for understanding human behavior are developed by interpreting attributes derived from motion, location, physiological signals and environmental information. The mobile phones present an attractive platform for people-centric applications as they integrate a variety of sensors that may make similar observations as human. Most smartphones have built-in sensors like GPS, accelerometer, orientation, gravity, rotation, lighting, audio, proximities, pressure, temperature and widely available sensors to sense individual activities. My research problem will be to investigate whether Kinect as a device, when combined with the smartphone sensor, one can implement an interactive system targeted at monitoring, measuring and assessing physical activity of an individual A general representation of the technical module of our proposed human action detection also known as human activity recognition system and its principal components. The system uses multi-sensor in terms of five technical modules, namely user engagement, feature extraction, machine learning model, action recognition and feedback/evaluation modules. The Microsoft Kinect Software Development Kit (SDK) and the depth stream are not used. Instead, the Kinect color stream and skeletal tracking are processed directly. The system takes participant action sequence captured by Kinect and the smartphone as input. The engagement of user is made of two part; Kinect and smartphone processing. While Kinect directly adopts the joint position prediction to obtain a structure of joints estimated skeletons, an estimation algorithm is processed to communicate with accelerometer data of the smartphone. Feature extraction is processed in the next part based on the pose estimation. Our finding is specialized for the support of weight and the adaptation to the gravity of a user, therefore, the whole skeleton joint of the sensor was not activated, and attention was drawn to the lower limb of the human anatomy. Based on multi-sensor approach for the accomplishment of high accuracy rates, a three stage system will be used for human action detection. The first part is to tap on the smartphone inbuilt sensor for steps counting. This is done via Android phone and the MATLAB Support Package for Android OS Sensors to communicate with accelerometer data of the smartphone. The most popular skeleton sensor technology of Microsoft Kinect for skeleton tracking with multi-function is used for the second part. And finally, the system utilizes random decision forest and kNN to compute steps and select the best-first search hierarchy containing the maximum distance at which the nearest neighbor step can be found.

1. System Design Description: A general representation of the technical module of our proposed human action detection also known as human activity recognition system and its principal components. 2. Action Detection: Based on multi-sensor approach for the accomplishment of high accuracy rates, a three stage system will be used for human action detection. 2.1. Stage One – Data Acquisition with Smartphone: For accuracy purposes, we have developed an algorithm based on Android phone and the MATLAB Support Package for Android OS Sensors. 2.2. Stage Two – Human Activity Detection via Kinect: Human activity estimation represented by the joint matched skeleton can be obtained with the aid of Kinect full body analysis middleware developed by PrimeSense . 2.3. Stage Two – On Kalman Filter Application: The Kalman filter is a recursive algorithm for estimating a set of unknown parameters based on a set of observed measurements. 2.4. Stage Three – On Random Forest Decision Application: A random decision forest is an ensemble of several tree classifiers. This stage will starts with a general outline, recalling the RDF framework, as well as details of the algorithm, is provided Natural user interface(NUI) as the next evolutionary stage in computing from the graphical user interface (GUI), as the GUI was from the command-line interface (CLI) it has become a massive interest of research since the beginning of the lunched Microsoft Kinect in 2010, hence my objectives and contribution will be to; 1. Implement an interactive system targeted at monitoring, measuring and assessing physical activity of an individual. 2. Study the Machine Learning algorithm; Random Decision Forest (RDF) Kinect Sensor uses to make decision or track participant location and how they move in space. 3. Study kNN for additional steps that seem intuitive but not automatically detected/ recognized by the accelerometer of the phone while step recording based on the maximum distance to the peak of the tracked step. 4. Explored Extended Kalman Filter (EKF) to improving skeleton joint estimation for precise joint parenthesis. 5. Study an approach of visualizing user data calibration and fine motor recognition in realtime motion tracking to the naked-eye in a room environment. At the end, my conclusion will be geared towards the fact that the immerging of new interaction techniques with pre-existing abilities trading with everyday life such that if entirety we perceive, touch or walk around is interactive, how our preconceived idea of such environment we are Human Activity Recognition is an active research field in which methods for understanding human behavior are developed by interpreting attributes derived from motion, location, physiological signals and environmental information. The mobile phones present an attractive platform for people-centric applications as they integrate a variety of sensors that may make similar observations as human. Most smartphones have built-in sensors like GPS, accelerometer, orientation, gravity, rotation, lighting, audio, proximities, pressure, temperature and widely available sensors to sense individual activities. My research problem will be to investigate whether Kinect as a device, when combined with the smartphone sensor, one can implement an interactive system targeted at monitoring, measuring and assessing physical activity of an individual.Due to these multi-ability of the above mentioned, we observe that the phone can be used as a wearable device (or basically hold in the hand) and the MATLAB Support Package for Android Operating System (OS) Sensors to communicate with accelerometer data of the phone from an instance of MATLAB in the cloud for steps tracking and the skeleton sensor technology of Microsoft Kinect to accurately detect person‘s skeletons with multi-function for posture detection within an estimated period of time of the participant. Therefore, these motivate us to carry out research finding with these two different commodity sensors. Besides, we engaged randomized decision forest (RDF) for additional steps that seem intuitive but not automatically detected/recognized by the accelerometer of the phone while step recording and kNN for the maximum distance to the peak of the tracked step. The kNN is not just the nearest neighbour (k 1) but rather alternative pruning technique (the MaxNearestDist estimator) [13] that uses an upper bound corresponding to the maximum possible distance at which the nearest neighbour is guaranteed to be found [14]. Although the impression of using these two sensors for detection may seem simple, many challenges arise in practice. Firstly, Kinect field of view is limited and can see one‘s head and body between a distance of 0.8 meters (2.6 feet) and 4.0 meters feet, a single Kinect cannot perform such activities for a longer period of time