

## **Seminar Talk**

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**PhD Candidate**

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**Friday, October 23, 2015**  
**3:00 p.m. KH 224**

**Title:** 3D Facial Expression and Visual Stimuli Analysis for Autism Spectrum Disorders

### **Abstract:**

Autism Spectrum Disorder (ASD) is a neurodevelopmental illness which is characterized by impairments in social communication with restricted activities and interests. ASD causes severe anxiety and stress among the children with ASD and their parents to cope with the behavioral impairments. Although early diagnosis is possible and mostly preferable during infancy, it requires long term subject specific strategies for treatment to alleviate the symptoms. This necessitates profiling of an individual with ASD to understand subject specific deficits in behavioral and cognitive skills. The evaluation of such subject specific profile will facilitate intervention plans accordingly. This work, in collaboration with EVMS, proposes the use of multi-modal imaging sensors to investigate psychophysical data of the human participants while they engage in several tasks involving visualization, recognition, and manipulation. An Institutional Review Board (IRB) approved study is being conducted on human subjects in two groups: a group with ASD and a group with typically developing individuals. An experimental setup is designed that integrates a hardware-software system to automatically collect multi-modal psychophysical data of the participant. We postulate that visual stimuli within the study protocol will elicit differential psychophysical responses in subjects with ASD, which can be learned from their facial and visual response data. The presentation will provide an overview of the study and computational approaches to quantify human affect from 3D facial point cloud data and 2D facial image frames of video data. Preliminary results will be presented to show the differential traits of the group with ASD following the proposed computational methods.

### **Bio:**

Manar D. Samad is a PhD candidate in the ECE Vision Lab at ODU. He received his MS degree in Computer Engineering from the University of Calgary in 2011 and BS in Electrical and Electronic Engineering from Bangladesh University of Engineering and Technology in 2007. As a graduate research assistant, he worked under the supervision of neuroArm, one of the pioneers of the robot-assisted neurosurgical system. There he studied the effect of force feedback and 3D stereoscopic vision on the perception and performance of robot-assisted surgical tasks. He worked at the University of Calgary Human Computer Interaction Lab to develop virtual simulators for training and evaluating surgical procedures. Currently, he is working toward his

doctoral dissertation which contributes novel computer vision methods to compute atypical psychophysical responses in children with Autism Spectrum Disorders (ASD). The motivation of his current research is to provide quantitative and nonintrusive methods for sensing nonverbal behavior of a patient, which are currently qualitative and intrusive in the clinical practice. He has taught electrical engineering courses at undergraduate level for two years and has published seven international research articles as first author. His research interests include Computer Vision, Machine Learning, Affective Computing, Virtual Reality, and Human-Computer Interactions.