Feb 13th, 8:00 AM - 12:30 PM

Poster Session

Honors College, ODU

8:00 AM-12:30 PM (Learning Commons: Northwest Atrium) Poster Session

Real Time Multi-Class Facial Expression Recognition For Therapeutic Aid In Autism Spectrum Disorders
Megan Witherow and Tucker Wash (Mentor: Dr. Khan M. Iftekharuddin)
Electrical Engineering

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social-emotional reciprocity, nonverbal communication, and relationship building. Earlier studies report oddity as lack of natural traits in the facial expressions of affected individuals. The development of therapeutic tools to train and correct oddity in facial expressions may help children with ASD overcome related challenges in nonverbal communication. The goal of this project is to develop a real-time software application for recognizing facial expressions from live video feed to supplement a research platform for studying the efficacy of robot-mediated intervention in children with ASD.

Training of CSRN
Bryan Brevard (Mentor: Dr. Khan M. Iftekharuddin)
Electrical Engineering

In the past decade researchers put significant effort to solve complex problems using Artificial Neural Networks (ANNs). A unique type of ANN known as a Cellular Simultaneous Recurrent Network (CSRN) has shown excellent performance for solving complex topological mapping problems such as maze traversal. However, the complexity of CSRN architecture makes it very hard to train. Researchers in ODU's Vision Lab have improved the training by introducing Unscented Kalman Filter (UKF) algorithm but it is not yet real time. In this research we plan to implement CSRN in a hardware platform to achieve real time performance for large scale problems.

Software Defined Radio Implementations for HDTV Receivers
Peter Oelslager (Mentor: Dr. Dimitrie C. Popescu)
Electrical Engineering

The poster presents research on digital modulation techniques currently in use for high definition broadcast television (HDTV) in North America, how those signals are implemented using software defined radios (SDRs), and how are they affected by noise. The MPEG video standard along with the ATSC information transmission protocol for video and audio data has been studied, and receivers for QAM modulation schemes have been implemented on HackRF and Universal Software Radio Peripherals (USRP). Noise effects and bandwidth requirements for these two types of SDRs have been compared in the project.

Low-Cost Communication System Implementations Using Raspberry Pi and Software Defined Radio Platforms
Ntiana Sakioti (Mentor: Dr. Otilia Popescu)
Computer Engineering

The poster presents research on implementing low-cost communication systems using Universal Software Radio Peripherals (USRP) from National Instruments/Ettus Research. A Raspberry Pi single-board computer is used to program two USRP boards to act as transmitter and receiver, respectively, and to establish a radio link. Through appropriate programming the types of transmitter and receiver implemented can be changed to accommodate multiple modulation schemes and radio interfaces. A live demo of the system is also planned for presentation along with the research poster.

Challenges Of *Scenedesmus* Cultivation For Biofuels
Siobhan McFarlane (Mentor: Sandeep Kumar)
Civil Engineering

The process of lipid extraction from *Scenedesmus* calls for a sizeable amount of algae. In order to reach the extraction stage, aquaculture must first be used to grow and harvest usable algae. Through inoculation of starter bottles from a single vial of 10 mL along with consistent effort and time to continue the growth process, the end results are algal columns of sizeable means (70 litres). The current challenges of column scale-up include, but are not limited to, the presence of cyanobacteria and rotifers, which delay progress and are being further investigated in order to remove further hindrances.

Familiar Video Stories as A Means for Children with Autism: An Analytics Approach
Alexis Brueggeman (Mentor: Dr. Nikos Chrisochoides)
Computer Science

Chen et al. developed a video face replacement technology, which presents a unique and individualized video to a child with Autism Spectrum Disorder (ASD) that includes familiar faces and places. With this technology, it was found that the personalized videos encouraged children with ASD to express more positive emotions during a novel experience. In order to ascertain how much of the desired information was actually gleaned from watching the video social story, an existing video learning analytic system was used to determine how subjects with ASD perceived the videos. The preliminary results of this pilot study indicate the need for further investigation into how the user interface and its enhancements can provide precise information on the perception and cognition of the individuals with ASD.

Designing Mobile Educational Games for Informal Learning Environments
David Jones (Mentor: Dr. Nikos Chrisochoides)
Computer Science

This research focuses on the integration of mobile technology with STEM education in "informal learning environments," such as museums and aquaria. In this stage of a multi-year study, a game for mobile devices is being designed that instructs high school students in earth science and mathematical reasoning. The game corresponds to the "Journey of Water" exhibits at the Virginia Aquarium, and can be used by students as they progress through the exhibits. The researchers used semi-structured interviews with aquarium staff and STEM education specialists to create the design guidelines. The game may potentially improve engagement and learning at such centers.

Gamma Spectroscopy Analysis Of An Unknown Photopeak
Wesley Lacaze (Mentor: Dr. Gail Dodge)
Physics

During gamma spectroscopy experiments conducted using a NaI scintillator detector an unknown peak was noticed in the background spectrum when no radioactive sources were present. This peak could potentially affect further experiments using the gamma spectroscopy detection system if the peak is either an error in the detection system or an unknown radiological source. An investigation was conducted to examine this unknown peak by establishing multiple background spectra with a calibration process using known radiological sources to determine the energy of the observed peak. Shielding experiments were also used in an attempt to determine if the source of the peak was something within the detector or being caused by an isotope in the surrounding environment. This investigation showed that the unknown peak was being produced outside of the detection system. Through research of known isotopes in the vicinity of the energy observed for the unknown peak it was shown that there is a high probability that Potassium-40 is the source of the peak. Further experiments were conducted using known Potassium sources; concentrated potassium in pill form showed a distinct increase in the investigated peak, giving a high confidence that Potassium-40 is the source of the unknown peak.

Sequence Alignment of Malware Data
Daniel Brill (Mentor: Dr. Yaohang Li)
Computer Science

Sequence alignment has been used to align DNA sequences to find matching segments of DNA from different specimens. Theses DNA sequences can be used to find similar patterns in DNA, this process can also be used on computer programs to identify when segments of code have been reused. Malware programs are made most of the time from other malware programs or malware templates. We can sequence align the byte information of these decompiled programs to identify them as malware from known

samples. Sequence alignment is a time consuming process but when a sequence has been found it can be used to identify malware orders of magnitude faster then the sequence alignment of two whole files.

Have Retailers Modified the Way they Sell Toys?
Sarah Brown (Mentor: Dr. Brooke Schaab)
Psychology

Research using toy catalogs during the 2014 Christmas season suggested that retailers market toys in gender specific way (Cross, Scott, and Schaab, 2015). Even more disturbing was the finding that STEM toys were almost exclusively shown with boy models. Negative feedback from parents led to retailers claiming to advertise in a gender neutral fashion this season. Research compared 2014 and 2015 advertising from 3 major retailers to determine if advertising was more gender neutral. Data collected in 2014 suggested that a young-adult population may view toys as more gender neutral. Therefore, we explored how different adult age groups classified toys.

Developing a Measure of Psychological Aggression: Stage 2
Arushi Deshpande (Mentor: Miguel Padilla)
Psychology

Current research indicates that psychological aggression can lead to physical aggression. Thus, accurate measures of psychological aggression can be used to quell future physical aggression. However, unsound psychometric properties and fragmented definitions have diminished the accuracy of current psychological aggression scales. The purpose here is to create a sound psychological aggression scale. This part of the study focused on pilot testing preliminary items written to capture behaviors that constitute psychological aggression. An analysis revealed that some preliminary items required removal because of their abnormal distributions. The next step is to field test the items to establish the factor structure of the new scale.

Developing a Measure of Internalized Homophobia/Biphobia: First Steps
Jessica Burgess (Mentor: Miguel Padilla)
Psychology

Internalized homophobia/biphobia is defined by private feelings of segregation and self hatred in relation to sexual orientation. How internalized homophobia/biphobia manifests in the lesbian, gay, and bisexual communities is pertinent due to its social consequences. However, existing scales are not inclusive of all sexual minorities and in some cases use heterosexuals. This study has two purposes: establish what thought processes define internalized homophobia/biphobia and create a scale based off this definition. To achieve this goal, focus groups from various sexual minorities will be used to provide information as to what constitutes internalized homophobia/biphobia. The focus group information will then be used to write preliminary items for pilot testing.

The ratio of human hosts among species of ticks found in the Mid-Atlantic
Cameron Lenahan (Mentor: Dr. Holly Gaff)
Biological Sciences

Ticks are ectoparasitic animals known to be vectors of various diseases known to be pathogenic to humans. In this study, we explore several species of ticks, their likelihood to use humans as hosts, and compare the results to findings of our active surveillance project. The species of ticks include the American dog tick, lone star tick, blacklegged tick, and Gulf Coast tick. We limited ourselves to obtaining data from various sites found in Virginia, Maryland, Delaware, and North Carolina. Data was obtained by flagging as well as submission from volunteers of ticks found on themselves. We found fewer American dog ticks on human hosts than lone star ticks; however, when the number of encounters is compared to the total number of American dog ticks found through flagging, the percentage skyrockets. Based on our results, we found that American dog ticks are far more likely to feed on human hosts than lone star ticks.

How sequence directs structure: My first steps to unlock the protein folding code in GB1
Brittney Ruedlinger (Mentor: Dr. Lesley Greene)
Chemistry and Biochemistry

The β1 domain of Streptococcal protein G consists of 56 amino acid residues arranged in a two-layer alpha-beta sandwich. We are interested in understanding how the sequence encodes the three-dimensional structure of this protein. In support of this research investigation, two mutations were selected, designed and synthesized. The first is glutamic acid 42 to glycine and the second is valine 39 to alanine. The variant proteins were expressed in preparation for future experimental studies which will involve purifying the proteins as well as conducting thermodynamic and kinetic studies to elucidate the effect of the mutations on structure, stability and folding.

Program Evaluation: Participatory Evaluation Model
Kathryn Macken (Mentor: Narketta Sparkman-Key)
Human Services

This presentation will focus on utilizing participatory evaluation model in conducting program evaluation. The roles of the stakeholders in the evaluation process will be explored.

The Role of Observation in Naturalistic Program Evaluation
Jamie Anderson (Mentor: Narketta Sparkman-Key)
Human Services

This presentation will focus on utilizing observations as a method of collecting qualitative information when evaluating programs.

Objective Based Program Evaluation
Julie Snell (Mentor: Narketta Sparkman-Key)
Human Services

This presentation will focus on utilizing objective based model in program evaluation of community agencies.

Program Evaluation: Examination of Healthy Lifestyles
Anaya Porter (Mentor: Narketta Sparkman-Key)
Human Services

This presentation will focus on afters school and summer programs that focus on healthy lifestyles utilizing program evaluation methods.

Naturalistic Program Evaluation: A Review of an After School Tutoring Program
Kendra Reed (Mentor: Narketta Sparkman-Key)
Human Services

This poster will outline the research methods involved in program evaluation utilizing the Naturalistic Program Evaluation Model.

Utilizing Program Evaluation to Examine Effective Case Management Practices
Ariyan McDonald (Mentor: Narketta Sparkman-Key)
Human Services

This presentation will review the relationship between program evaluation and research methods to explore effective case management practices.