

TRIDENT SCHOLAR CONFERENCE

Conference Opening Remarks and Presentations

Conference Moderator

Professor Carl E. Wick
Associate Director of Midshipman Research

Thursday, 23 April 2009

0755-1145 and 1330-1515

Rickover Hall, Room 103

0755

Welcome and Opening Remarks

0805

Midshipman First Class Megan Elise Selbach-Allen

Using Biomechanical Optimization to Interpret Dancers' Pose Selection for a Partnered Spin

Using motion capture and a biomechanical model, we investigated whether expert swing dancers perform a partnered spin around a common axis in an optimal way. We used optimization techniques to find poses that maximize acceleration of a partnered spin for two dancers, and compared these to the poses chosen by expert and beginner dancers.

0900

Midshipman First Class Bradley James Ullis

Iris Recognition using Parallel and Sequential Logic in a Reconfigurable Logic Device

Iris recognition is the identification and authentication of a person using a picture of the colored part of the eye. This project implements an entire system that executes an iris detection algorithm on a Field Programmable Gate Array. It balances software with hardware design to speed up processing and reduce overall hardware footprint. With the development of a biometric system on a reconfigurable device, iris recognition and much more can be tested and evaluated with minimal hardware reconfiguration.

1000

Midshipman First Class Aaron Paul Haviland

Characterizing the Hercules Thick Disk Cloud

Astronomical observations indicate an area of excess stars towards the galactic center called the Hercules Thick Disk Cloud. There are three possible origins: 1) a galactic merger, 2) interaction with the stellar bar, or 3) a previously unidentified triaxial shape. This project examined the types and distribution of stars in this excess area in order to deduce their most likely origin.

1100

Midshipman First Class Brett William Sadowski

Design, Synthesis and Testing of Novel Antimalarial Compounds Based Upon a Novel Chemical Lead

Development of drug resistance means new treatments are needed for malaria. To this end, novel compounds were designed and prepared from commercially available materials. Following confirmation of structure using modern spectroscopic techniques they were tested for antimalarial activity both in *in vitro* and in *in vivo* assays.

1330

Midshipman First Class Jacob Paul Dobisesky

Monitoring Cosmic Radiation Risk: Comparisons between Observations and Predictive Codes for Naval Aviation

A portable tissue equivalent proportional counter was used in flight to determine radiation risk to pilots, aircrew, and passengers. Flights were conducted on military, commercial, and private aircraft. Field measurement comparisons were made to validate several predictive commercial codes for assessing radiation risk. The study revealed statistical agreement of the codes with the data and demonstrated the potential use of these codes to assess radiation risk to naval aviators.

1430

Midshipman First Class William Clayton Selby

Urban Convoy Escort Utilizing a Swarm of UAVs

This project, in conjunction with the Naval Research Lab, evaluated and modified a current Unmanned Aerial Vehicle (UAV) control algorithm to perform a security role for military convoys in urban terrain. Through several simulated practical scenarios, the limitations of the control algorithm were identified, several effective blending algorithms were proposed, and a design process was created to guide future NRL investigations.

Friday, 24 April 2009

0755-0945

Rickover Hall, Room 103

0755

Welcome and Opening Remarks

0805

Midshipman First Class Christina Jean Moore

Development of an Integrated Robotic Radioisotope Identification and Location System

This project involved the integration of a commercial high purity germanium detection system with a robotic platform for use in radioisotope identification and location. An extensive characterization of the system's response was performed based on bearing calculations algorithms using LIDAR with position feedback and simple triangulation techniques.

0900

Midshipman First Class Charles Curtis Jones

Performance and Analysis of Vortex Oxidizer Injection in a Hybrid Rocket Motor

In order to boost performance in hybrid rocket motors, a method of increasing fuel burn rate has been developed that uses an oxidizer vortex within the combustion chamber. The effects of this vortex have been modeled analytically and then compared experimentally to a typical axial flow configuration. A test apparatus has been developed that allows multiple motor firings in various relevant configurations.