

AGENDA - 2009 Senior Thesis Project Presentations

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AGENDA - 2009 Senior Thesis Project Presentations

Alphabetical Listing of Presenters

LAST NAME	FIRST NAME	ABSTRACT PAGE #	PRESENTATION TIME	PRESENTATION LOCATION	THESIS ADVISOR
Alexander	Brian Jackson	45	1:00-1:25p.m.	ISAT Room 348	Dr. Handley
Artale	Benjamin Lee	43	10:15-10:55a.m.	ISAT Room 348	Dr. Prins
Ashton	Michael Charles	53	11:15-11:55a.m.	ISAT Room 350	Mr. Ridings
Atkins	Jason Dale	43	10:15-10:55a.m.	ISAT Room 348	Dr. Prins
Bailey III	Bryce Bishop	38	3:15-3:55p.m.	ISAT Room 150	Dr. Papadakis
Bornarth	Michael Ryan	17	3:20-3:50p.m.	ISAT Room 136	Dr. Miles
Brautigan	Andrew Lewis	40	8:00 – 8:40a.m.	ISAT Room 348	Dr. Brodrick-Hartman
Burk	Brian Michael	13	1:00-1:30p.m.	ISAT Room 136	Dr. Miles
Caldwell	Sara Elizabeth	19	10:00 – 10:25 a.m.	ISAT Room 148	Dr. Raab
Carper	Briana Leigh	39	4:00-4:40p.m.	ISAT Room 150	Dr. Teel
Carper	Christopher Thomas	52	10:30-11:10a.m.	ISAT Room 350	Dr. Zarrugh
Ciulla	Amy Marie	38	3:15-3:55p.m.	ISAT Room 150	Dr. Papadakis
Coleman	Erin V.	23	1:00 – 1:25 p.m.	ISAT Room 148	Dr. McKown
Curry	James Robert	28	3:30 – 3:55 p.m.	ISAT Room 148	Dr. Frysinger
Dai	Barry Beinan	38	3:15-3:55p.m.	ISAT Room 150	Dr. Papadakis
Deskins	James Vincent	48	3:00-3:25p.m.	ISAT Room 348	Dr. Benzing
Emmart	Cameron	57	2:45-3:25p.m.	ISAT Room 350	Dr. Teate
Fadoul	Thomas John III	59	4:00-4:25p.m.	ISAT Room 350	Dr. Benton
Gains	Kristen Breese	52	10:30-11:10a.m.	ISAT Room 350	Dr. Zarrugh
Gaughen	Alyssa Marie	27	3:00 – 3:25 p.m.	ISAT Room 148	Dr. Klevickis
Geiger	Douglas Paul	47	2:15-2:55p.m.	ISAT Room 348	-Dr. Teel -Dr. Tang
Giordano	Coryn Catherine	41	9:00-9:40a.m.	ISAT Room 348	Dr. Tucker
Hakes	Anthony Michael	55	1:00-1:40p.m.	ISAT Room 350	Dr. Benton
Heiman	Kyle Matthew	55	1:00-1:40p.m.	ISAT Room 350	Dr. Benton
Herbert	Jacob Matthew	32	10:30-11:10a.m.	ISAT Room 150	Dr. Bachmann
Hill	Daniel Patrick	36	2:00-2:40p.m.	ISAT Room 150	Mr. Goodall
Hofmaenner	Kevin Peter	37	2:45-3:10p.m.	ISAT Room 150	Dr. Papadakis
Howell	Kenneth Raymond	14	1:35-2:05p.m.	ISAT Room 136	Dr. Miles
Jacobson	Hilary	19	10:00-10:25a.m.	ISAT Room 148	Dr. Raab
Jaramillo	Nicolas	46	1:30-2:10p.m.	ISAT Room 348	Dr. Teel
Jenkins	Tiffany Anne	20	10:30–10:55 a.m.	ISAT Room 148	Dr. Raab
Johnson	Gordon Coleman	49	3:30-4:10p.m.	ISAT Room 348	Dr. Benzing
Johnson	Reece Cantrell	56	2:15-2:40p.m.	ISAT Room 350	Dr. Teate
Karnes	Katlyn	44	11:00-11:40a.m.	ISAT Room 348	-Dr. Papadakis -Dr. Bsumek
Kachelries	Patricia Lynn	19	10:00 – 10:25 a.m.	ISAT Room 148	Dr. Raab
Kimberly	Morgan	24	1:30 – 1:55 p.m.	ISAT Room 148	Dr. McKown
Kinnally	Kyle Brandon	47	2:15-2:55p.m.	ISAT Room 348	-Dr. Teel -Dr. Tang
Kogge	Kathryn Marie	26	2:30- 2:55 p.m.	ISAT Room 148	Dr. Klevickis

AGENDA - 2009 Senior Thesis Project Presentations

Alphabetical Listing of Presenters (continued)

LAST NAME	FIRST NAME	ABSTRACT PAGE #	PRESENTATION TIME	PRESENTATION LOCATION	THESIS ADVISOR
Levitt	Dan	47	2:15-2:55p.m.	ISAT Room 348	-Dr. Teel -Dr. Tang
Macko	Patrick James	36	2:00-2:40p.m.	ISAT Room 150	Mr. Goodall
Martin	Michael Thomas	25	2:00- 2:25 p.m.	ISAT Room 148	Dr. McKown
McAdoo	Doug	44	11:00-11:40a.m.	ISAT Room 348	-Dr. Papadakis -Dr. Bsumek
McCarthy	Steven Joseph	51	10:00-10:25a.m.	ISAT Room 350	Dr. Egekwu
McMahon	Michael James	54	1:45-2:10p.m.	ISAT Room 350	Dr. Benton
Morrison	Edward	15	2:10-2:40p.m.	ISAT Room 136	Dr. Miles
Murray	Christa Jane	41	9:00-9:40a.m.	ISAT Room 348	Dr. Tucker
Nguyen	Hai	57	2:45-3:25p.m.	ISAT Room 350	Dr. Teate
Oteiza	Katharine Elise	31	10:00–10:25 a.m.	ISAT Room 150	Dr. Tang
Phillips	Chantell Lace	50	4:15-4:40p.m..	ISAT Room 348	-Dr. Benzing -Dr. Papadakis -Dr. Pappas
Powanda	Ryan Michael	16	2:45-3:15p.m.	ISAT Room 136	Dr. Miles
Ramseyer	Craig	18	4:00-4:25p.m.	ISAT Room 136	Dr. Goodall
Reed	Michael Christopher	36	2:00-2:40p.m.	ISAT Room 150	Mr. Goodall
Regan	Brendan	29	4:00-4:25p.m.	ISAT Room 148	Dr. Wenos
Regan	Scott Wilson	35	1:30-1:55 p.m.	ISAT Room 150	-Mr. Rudmin -Dr. Chen
Riggs	Brian Douglas	32	10:30-11:10a.m.	ISAT Room 150	Dr. Bachmann
Russo	Theresa Diane	58	3:30-3:55p.m.	ISAT Room 350	Dr. Biesecker
Schultz	Jessica	44	11:00-11:40a.m.	ISAT Room 348	-Dr. Papadakis -Dr. Bsumek
Schwee	Matthew James	22	11:30-11:55a.m.	ISAT Room 148	Dr. Temple
Selkregg	Ryan Matthew	53	11:15-11:55a.m.	ISAT Room 350	Mr. Ridings
Shepard	Katherine Alexandra	44	11:00-11:40a.m.	ISAT Room 348	Dr. Papadakis
Smith	Joshua Raffiel	20	10:30 – 10:55p.m.	ISAT Room 148	Dr. Raab
Staley	Scott Justin	32	10:30-11:10a.m.	ISAT Room 150	Dr. Bachmann
Stone	Jeremy	44	11:00-11:40.am.	ISAT Room 348	-Dr. Papadakis -Dr. Bsumek
Sullivan	William Bradley	49	3:30-4:10p.m.	ISAT Room 348	Dr. Benzing
Talley	Nathaniel Day	21	11:00 – 11:25a.m.	ISAT Room 148	Dr. Raab
Tang	Bonnie	46	1:30-2:10p.m.	ISAT Room 348	Dr. Teel
Thomas	Emily Catherine	33	11:45-12:10p.m.	ISAT Room 150	Dr. Bachmann
Torok	Jacob Anselm	34	1:00-1:25p.m.	ISAT Room 150	Dr. Chen
Trimble	Christopher Morris	43	10:15-10:55a.m.	ISAT Room 348	Dr. Prins
Truglio	Allison Renee	39	4:00-4:40p.m.	ISAT Room 150	Dr. Teel
Turner	Jeffrey Scott	42	9:45-10:10a.m.	ISAT Room 348	Dr. Tucker
Webber	Briana Renee	30	4:30 – 4:55 p.m.	ISAT Room 148	-Dr. Cockley -Mr. Nye
Wolfendale	Lindsay Marie	44	11:00-11:40a.m.	ISAT Room 348	Dr. Papadakis

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 1 – ISAT/CS BUILDING - ROOM 136

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
1:00 – 1:30 p.m.	06-09S	Brian Burk	Feasibility Study and Implementation Plan for Wind Power in a Developing Country <i>Advisor: Dr. Jonathan Miles</i>
1:35 – 2:05 p.m.	45-09S	Kenneth Howell	First-Order Feasibility Study for Wind Power at a Military Installation in Virginia <i>Advisor: Dr. Jonathan Miles</i>
2:10-2:40 p.m.	46-09S	Edward Morrison	First-Order Feasibility Study for Wind Power at an Aquaculture Facility in Virginia <i>Advisor: Dr. Jonathan Miles</i>
2:45 – 3:15 p.m.	30-09S	Ryan Powanda	Chesapeake Clean Energy Initiative: Preliminary Study for Onshore Wind Turbine Siting in a Remote Island Community <i>Advisor: Dr. Jonathan Miles, Ms. Luerssen, Mr. Patrick Wilson</i>
3:20 – 3:50 p.m.	05-09S	Michael Bornarth	Market Analysis and Usage Study of a Hand Held Instrument for Infrared-Based Non-Destructive Evaluation of Wind Turbine Blades <i>Advisor: Dr. Jonathan Miles</i>
4:00-4:25p p.m.	44-09S	Craig Ramseyer	Effects of El Nino Southern Oscillation on spatial patterns of Central United States Tornadoes <i>Advisor: Dr. Amy Goodall</i>

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 – ISAT/CS BUILDING - ROOM 148

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
10:00 –10:25a.m.	07-09T	-Sara Caldwell -Hilary Jacobson -Patricia Kachelries	Site-Directed mutagenesis of Rare to Common Codons For the Expression of Human Lacritin in <i>E. coli</i> Advisor: Ron Raab
10:30-10:55a.m.	21-09T	-Tiffany Jenkins -Joshua Smith	Oxygen Depletion in Level A HAZMAT Suits Advisor: Dr. Ron Raab
11:00-11:25a.m.	33-09S	Nathaniel Talley	Cloning the Lacritin-C Variant Advisor: Dr. Ron Raab
11:30-11:55a.m.	32-09S	Matthew Schwee	Examining the Large Novel Surface Proteins Coded by BAV1944 and BAV1945 in <i>Bordetella avium</i> Advisor: Dr. Louise Temple
1:00-1:25p.m.	09-09S	Erin Coleman	Characterization of Antimicrobial Activity for the Human Tear Protein Lacritin Advisor: Dr. Robert McKown
1:30-1:55p.m.	24-09S	Morgan Kimberly	Conformational Analysis of Recombinant Lacritin Variants Advisor: Dr. Robert McKown
2:00-2:25p.m.	39-09S	Michael Martin	Characterization of an Unknown Lacrimal Gland Secretory Protein Advisor: Dr. Robert McKown

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 – ISAT/CS BUILDING - ROOM 148 **(CONTINUED)**

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
2:30-2:55p.m.	25-09S	Kathryn Kogge	Preparation of the CoRPS (City of Richmond Progression in Science) Program to link ISAT Graduate Students to Virginia High Schools <i>Advisor: Dr. Cindy Klevickis</i>
3:00-3:25p.m.	13-09S	Alyssa Gaughen	Montessori Education in Haiti and Proposal for Foundation Collaboration <i>Advisor: Dr. Cindy Klevickis</i>
3:30-3:55p.m.	10-09S	James Curry	The Effects of the Iodine Fuming Application on DNA from Fingerprints <i>Advisor: Dr. Steven Frysinger</i>
4:00-4:25p.m.	31-09S	Brendan Regan	Effect of Carbohydrate-Protein Supplementation during Endurance Exercise on Muscular Strength Immediately Following Exercise <i>Advisor: Dr. David Wenos</i>
4:30-4:55p.m.	38-09S	Briana Webber	Initial Patient Data Analysis of the Harrisonburg Community Health Center <i>Advisors: Dr. David Cockley, Mr. Christopher Nye</i>

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 – ISAT/CS BUILDING - ROOM 150

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
10:00-10:25a.m.	28-09S	Katharine Oteiza	Nanotechnology in Cosmetics: An Investigation of Nanotechnology in Personal Care Products <i>Advisor: Dr. Jeffrey Tang</i>
10:30-11:10a.m.	17-09T	-Jacob Herbert -Brian Riggs -Scott Staley	Super Mileage <i>Advisor: Dr. Christopher Bachmann</i>
11:45-12:10p.m.	34-09S	Emily Thomas	An Options Analysis of Transportation Fuels for Tangier Island, Virginia <i>Advisor: Dr. Christopher Bachmann</i>
1:00-1:25p.m.	35-09S	Jacob Torok	<i>Installation and Analysis of a Photovoltaic System on Keezletown Elementary School</i> <i>Advisor: Dr. Tony Chen</i>
1:30-1:55p.m.	41-09S	Scott Regan	Improvement of Energy Photovoltaic Lab with Ultrahigh Efficiency Cells <i>Advisors: Mr. Joseph Rudmin, Dr. Tony Chen</i>

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 – ISAT/CS BUILDING - ROOM 150

(CONTINUED)

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
2:00-2:40p.m.	18-09T	-Daniel Hill -Patrick Macko -Michael Reed	The Future of Fuel: Switchgrass Based Cellulosic Ethanol <i>Advisor: Mr. Paul Goodall</i>
2:45-3:10p.m.	19-09S	Kevin Hofmaenner	Incentivizing Energy Conservation in Student Housing <i>Advisor: Dr. Maria Papadakis</i>
3:15-3:55p.m.	04-09T	-Bryce Bailey -Amy Ciulla -Barry Dai	Developing an Energy Management System for the JMU Residence Halls <i>Advisor: Dr. Maria Papadakis</i>
4:00-4:40p.m.	08-09T	-Briana Carper -Allison Truglio	Sustainable Engineering and Development <i>Advisor: Dr. Wayne Teel</i>

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 – ISAT/CS BUILDING - ROOM 348

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
8:00-8:40a.m.	40-09S	Andrew Brautigan	Driver's Environmental Education: A Two-Hour Workshop <i>Advisor: Dr. Christie-Joy Brodrick-Hartman</i>
9:00-9:40a.m.	15-09T	-Coryn Giordano -Christa Murray	Developing Surface Water Purification Technology and a Water Hygiene Education System for the African Community of Namawanga, Kenya <i>Advisor: Dr. W. Gene Tucker</i>
9:45-10:10.a.m.	36-09S	Jeffrey Turner	Pilot Scale removal of Manganese from Water by Ozone Treatment <i>Advisor: Dr. W. Gene Tucker</i>
10:15-10:55a.m.	02-09T	-Ben Artale -Jason Atkins -Chris Trimble	<i>ElectroMagnetic Shock Absorber (EMSA)</i> Advisor: Dr. Robert Prins
11:00-11:40a.m.	37-09T	-Katherine Shepard -Lindsay Wolfendale -Katlyn Karnes -Doug McAdoo -Jeremy Stone -Jessica Schultz	Indian Spring Wetlands Park Restoration Plan <i>Advisors: Dr. Maria Papadakis, Dr. Pete Bsumek</i>

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 – ISAT/CS BUILDING - ROOM 348

(CONTINUED)

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
1:00-1:25p.m.	01-09S	Brian Alexander	Design and Construction of a Rain Garden for Improvement of Stormwater Management <i>Advisor: Dr. Mary Handley</i>
1:30-2:10p.m.	20-09T	-Nicolas Jaramillo -Bonnie Tang	Design and Construction of a Wooded Wetland Area for Stormwater Remediation at the Future Rockingham Memorial Hospital Site <i>Advisor: Dr. Wayne Teel</i>
2:15-2:55p.m.	14-09T	-Doug Geiger -Dan Levitt -Kyle Kinnally	Feasibility Analysis of Anaerobic Digestion for Refrigeration in Namawanga, Kenya <i>Advisors: Dr. Wayne Teel, Dr. Jeff Tang</i>
3:00-3:25 p.m.	11-09S	James Deskins	Mini-Hydro Electric Power Plant <i>Advisor: Dr. Thomas Benzing</i>
3:30-4:10p.m.	22-09T	-Gordon Johnson -Brad Sullivan	Monitoring Water Temperature to identify Streams for Native Brook Trout Restoration <i>Advisor: Dr. Thomas Benzing</i>
4:15-4:40p.m.	29-09S	Chantell Phillips	CISAT Rain Garden <i>Advisors: Dr. Maria Papadakis, Dr. Thomas Benzing, Dr. Eric Pappas</i>

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 – ISAT/CS BUILDING - ROOM 350

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
10:00-10:25a.m.	26-09S	Steven McCarthy	Implementing Radio Frequency Identification (RFID) Technology to Airline Baggage Tracking for Aer Lingus <i>Advisor: Dr. Geoffrey Egekwu</i>
10:30-11:10a.m.	11-09T	-Chris Carper -Kristen Gains	Development of a Search and Rescue Robot for Use in Local Safety Departments <i>Advisor: Dr. Mohamed Zarrugh</i>
11:15-11:55a.m.	03-09T	-Michael Ashton -Ryan Selkregg	Backpack Mounted Kinetic to Electric Energy Conversion Unit Utilizing Faraday's Law of Magnetic Induction <i>Advisor: Mr. James Ridings</i>
1:00-1:40p.m.	16-09T	-Tony Hakes -Kyle Heiman	RoommateRoundup.com: Matching roommates based on compatibility, in the hands of the students <i>Advisor: Dr. Morgan Benton</i>
1:45 -2:10p.m.	27-09S	Michael McMahon	Web-Based Automation for LOTI Capacity Factor Analysis Model <i>Advisor: Dr. Morgan Benton</i>


AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 – ISAT/CS BUILDING - ROOM 350 **(CONTINUED)**

Time	Project No.	Student Name	Abstract Title & Thesis Advisor
2:15-2:40p.m.	23-09S	Reece Johnson	Patient Tracking with RFID Technology <i>Advisor: Dr. Anthony Teate</i>
2:45-3:25p.m.	12-09T	-Cameron Emmart -Hai Nguyen	A campus-wide Wi-Fi based real-time location and tracking emergency alert system <i>Advisor: Dr. Anthony Teate</i>
3:30-3:55p.m.	42-09S	Theresa Russo	Dengue Virus Type 2: Expression of Non-pathogenic Viral pre-Membrane (prM) and Envelope (E) proteins in African Green Monkey Kidney (VERO) Cells <i>Advisor: Dr. Amanda Biesecker</i>
4:00-4:25p.m.	43-09S	Thomas Fadoul III	"UMatter2Us"- Collaborative Learning Management System <i>Advisor: Dr. Morgan Benton</i>

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 1 ISAT/CS – ROOM 136

Thesis Title: <i>Feasibility Study and Implementation Plan for Wind Power in a Developing Country</i>	
Presentation Time: 1:00 – 1:30 p.m.	Thesis Abstract: The purpose of this project is to design and develop a plan to implement a small-scale wind power system for the town of Paso Bajito located in the Dominican Republic. With consideration for the numerous problems surrounding power generation in these areas such as high fuel costs, lack of infrastructure, and environmental concerns, renewable energy systems present a sustainable alternative to provide these communities affordable access to electricity to meet their basic needs. This project involved analyses of the local needs, the local wind resource, topography, wind turbine technologies, and manufacturers' support, and recommend a wind power system for the community. 
Presenter: -Brian Burk ISAT Major (ISAT 493)	
Presentation No.: 06-09S	
Thesis Advisor: Dr. Jonathan Miles	
External Sponsor: Least of These International	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 1 ISAT/CS – ROOM 136

Thesis Title: *First-Order Feasibility Study for Wind Power at a Military Installation in Virginia*

Presentation Time:

1:35 – 2:05 p.m.

Presenter:

-Kenneth Howell
ISAT Major (ISAT 493)

Presentation No.:

45-09S

Thesis Advisor:

Dr. Jonathan Miles

Thesis Abstract:

The objective of this project is to perform a first-order wind feasibility assessment for a potential wind turbine installation at the Naval Surface Warfare Center (NSWC), Dam Neck, near Virginia Beach, VA. The assessment includes the characterization of land use, topography, and wind resources, and involve site visits, data collection, and the modeling strategies. Potential environmental, regulatory, and technical requirements and conflicts are also examined and addressed. A final report and visual simulation were developed to provide NSWC, Dam Neck with the tools necessary to advance the development of wind power at their site for local power generation.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 1 ISAT/CS – ROOM 136

Thesis Title: *First-Order Feasibility Study for Wind Power at an Aquaculture Facility in Virginia*

Presentation Time:

2:10 – 2:40 p.m.

Presenter:

-Edward Morrison
ISAT Major (ISAT 493)

Presentation No.:

46-09S

Thesis Advisor:

Dr. Jonathan Miles

Thesis Abstract:

The purpose of this project was to create a first-order feasibility study for the application of wind power to supplement the electrical demand of Mid-Atlantic Aquatic Technologies in Quinby, Virginia. A 50 m anemometer tower installed on-site recorded wind-speed and direction to confirm and validate existing wind-maps. WA^SP and WindFarmer wind-analyzing programs were used to create a model of the potential electrical output and economic viability of a given wind turbine installed in the area. An analysis of multi-level government permitting requirements, environmental impacts, and community input was also completed.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 1 ISAT/CS – ROOM 136

Thesis Title: *Chesapeake Clean Energy Initiative: Preliminary Study for Onshore Wind Turbine Siting in a Remote Island Community*

Presentation Time:

2:45 – 3:15 p.m.

Presenter:

-Ryan Powanda

Major ISAT
Honors Thesis
(ISAT 499C)

Presentation No.:

30-09S

Thesis Advisors:

-Dr. Jonathan Miles
-Ms. Remy Luerssen
-Mr. Patrick Wilson

Thesis Abstract:

The purpose of this study is to assess the feasibility of siting a demonstration, commercial-scale wind turbine for onshore applications in the Chesapeake Bay, Virginia. The Chesapeake Bay presents a high-quality wind resource, and several studies have been conducted by the Virginia Wind Energy Collaborative (VWEC) investigating offshore wind development options in the region. Several sites were studied for viability including areas on Tangier Island and Port Isobel. Tangier Island is resident to a small fishing community in the Chesapeake Bay, while the adjacent Port Isobel is owned by the Chesapeake Bay Foundation and is used as an education and outreach center. The wind resource on the islands is being investigated using a 50-meter meteorological tower and the energy infrastructure was studied for potential interconnection of a wind turbine and energy storage equipment. Other considerations include impacts on environment and wildlife, siting concerns, project economics, relevant regulatory issues, and public opinion. The results of this study helped to inform a project proposal to the U.S. Department of Energy for funding for further research, development, and demonstration of commercial-scale wind and energy storage applications in the Chesapeake Bay region.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 1 ISAT/CS – ROOM 136

Thesis Title: <i>Market Analysis and Usage Study of a Hand Held Instrument for Infrared-Based Non-Destructive Evaluation of Wind Turbine Blades</i>	
Presentation Time: 3:20 – 3:50 p.m.	Thesis Abstract: In 1998, researchers at the NASA Langley Research Center developed a thermal line-scanning technique to non-destructively detect defects in materials by line-heating the surface of a target and imaging the surface with an infrared imager. Image subtraction was conducted to measure the temperature at each point on the material before and after heating and visualize sub-surface defects. Fellow ISAT students Curt Dvonch and Doug Suliga (2008) successfully developed a benchtop instrument to perform this technique by utilizing a microbolometer-based infrared imager, other miniaturized components, and space-saving design. My project involved the automation and optimization of the instrument with implementation of a stepper motor and application of testing to further the development of a handheld instrument. I have also conducted a market analysis and usage study of such a handheld instrument as would be applied within the wind power industry.
Presenter: -Michael R. Bornarth ISAT Major (ISAT 493)	
Presentation No.: 05-09S	
Thesis Advisor: Dr. Jonathan Miles	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 1 ISAT/CS – ROOM 136

Thesis Title: *Effects of El Nino Southern Oscillation on spatial patterns of Central United States Tornadoes*

Presentation Time:
4:00 – 4:25 p.m.

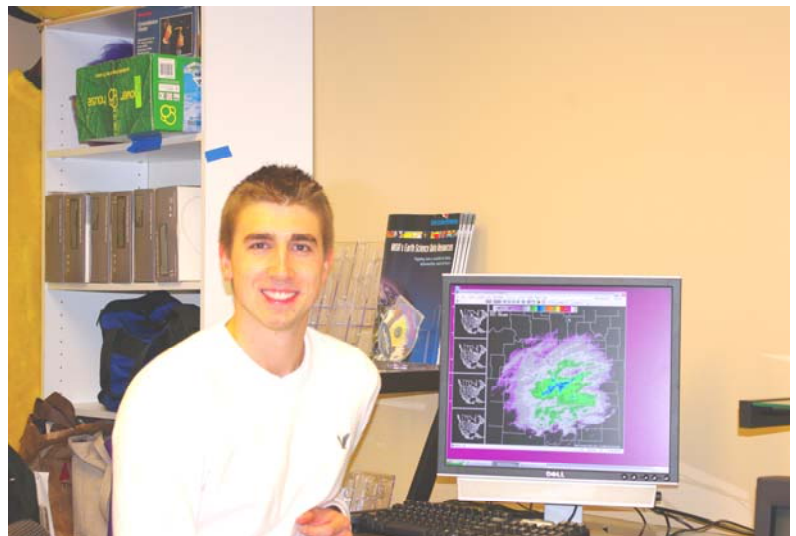
Presenter:
Craig Ramseyer
Geographic Science
Major
Honors Thesis
(ISAT 499C)

Presentation No.:
44-09S

Thesis Advisor:
Dr. Amy Goodall

Thesis Abstract:

The El Nino Southern Oscillation (ENSO) impacts global, regional, and local climate and weather. For example, ENSO can cause changes in temperature, precipitation, and tropical cyclone occurrence. One area of growing interest among atmospheric specialists is the effects of ENSO on tornado activity. This presentation summarizes research that was designed to study relationships between ENSO events and spatial patterns in tornadoes. A Geographic Information System was used to analyze frequencies and locations of tornado touchdowns in the Central United States from 1950-2006 to determine if patterns exist with ENSO. The data were analyzed by month into three time-period categories (El Nino, La Nina, and Normal Conditions) based on Pacific Sea Surface Temperatures. It was found that there are regions of high and low clustering of tornadoes that correspond with each of the time period categories.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: *Site-Directed mutagenesis of Rare to Common Codons For the Expression of Human Lacritin in E. coli*

Presentation Time:

10:00 – 10:25 a.m.

Presenters:

-Sara Caldwell
-Hilary Jacobson
-Patricia Kachelries
ISAT Majors (ISAT 493)

Presentation No.:

07-09T

Thesis Advisor:

Dr. Ron Raab


Thesis Abstract:

The human mature lacritin mRNA consists of 119 transcribed codons; however, 42 of these codons rarely occur with *E.coli* tRNAs. Rare codons slow the translation of proteins, thus causing a lower protein yield with an *E.coli* expression system. In this study, site directed mutagenesis will be used to make silent mutations in human lacritin DNA that change rare codons to common codons in *E.coli*. The decrease in rare codons will ideally increase the yield of human lacritin obtained from expression in *E.coli*.




AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: <i>Oxygen Depletion in Level A HAZMAT Suits</i>	
Presentation Time: 10:30 – 10:55 a.m.	Thesis Abstract: The levels of oxygen inside a vapor tight level A HAZMAT suits over a period of normal activity were examined. It has been documented and taught that after 20 minutes of physical activity on bottled air, an individual would be able to survive and function with the air inside the suit for five additional minutes in the event of an SCBA malfunction. Due to the accumulation of exhaled air within the suit, it is known that the oxygen concentration will decrease while carbon dioxide concentration will increase. Carbon dioxide gas concentrations were monitored within the suit while participants did moderate physical activity for 20 minutes. After 20 minutes of activity, participants removed their air supply and continued doing physical activity for as long as they were comfortable, but not exceeding five minutes. Also evaluated were each subject's heart rate, oxygen saturation, and respirations before, during, and after the test. Preliminary results indicated that within the first 20 minutes of activity, Oxygen concentration dropped below safe levels. Oxygen concentration dropped more dramatically after participants removed their air supply. 
Presenters: -Tiffany Jenkins ISAT Major Honors Thesis (499C) -Joshua Smith ISAT Major (ISAT 493)	
Presentation No.: 21-09T	
Thesis Advisor: Dr. Ron Raab	


AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: <i>Cloning the Lacritin-C Variant</i>	
Presentation Time: 11:00- 11:25 a.m.	Thesis Abstract: Lacritin, a unique tear protein produced in the lacrimal gland and secreted by acinar cell secretory granules, promotes human corneal epithelial cell proliferation and tear secretion. Due to low levels of expression within other cell and tissue types, lacritin is classified as an eye-specific growth factor and may be a vital factor for ocular surface epithelial cell maintenance and regeneration. It is therefore hypothesized that lacritin and lacritin variants may be a potential cure or treatment for Dry Eye Syndrome. The lacritin-C variant maintains the same amino acid sequence translated from the first three genomic DNA exons; however, a novel 39 amino acid sequence follows as a result from translation elongation and termination in intron 3. Genomic DNA analysis indicates lacritin-C is the result of a frameshift caused by a single nucleotide deletion in the last open reading frame of exon 3. In order to further examine lacritin-C, an oligonucleotide was synthetically designed, cloned into pTYB2 and pTYB12 vectors, and transformed into <i>E. coli</i> . Verification was obtained by agarose gel electrophoresis and DNA sequence analysis. Future studies utilizing lacritin-C may include quantitative and qualitative assays, as well as further molecular characterization of the variant, in order to provide a prevention or treatment for Dry Eye Syndrome. 
Presenter: -Nathaniel Talley Biotechnology Major (ISAT 493)	
Presentation No.: 33-09S	
Thesis Advisor: Dr. Ron Raab	


AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: <i>Examining the Large Novel Surface Proteins Coded by BAV1944 and BAV1945 in Bordetella avium</i>	
Presentation Time: 11:30- 11:55 a.m.	Thesis Abstract: BAV1944 and BAV1945 are the largest coding regions of <i>Bordetella avium</i> , a pathogenic bacterium that causes respiratory disease in poultry. These two genes were extensively characterized in order to better understand their purpose in the genome. Splicing by way of overlap extension PCR was attempted in order to create a mutant strain of <i>B. avium</i> lacking both of these genes. Furthermore, the antigenic region of BAV1945 was cloned and expressed and the resulting peptide was purified. Antibodies will be derived from this peptide and used for future research concerning the importance of these genes to the virulence of <i>B. avium</i> . 
Presenter: -Matthew Schweet Biotechnology Major Honors Thesis (ISAT 499C)	
Presentation No.: 32-09S	
Thesis Advisor: Dr. Louise Temple	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: <i>Characterization of Antimicrobial Activity for the Human Tear Protein Lacritin</i>	
Presentation Time: 1:00 – 1:25 p.m.	Thesis Abstract: Lacritin is a novel human protein secreted into tears from the lacrimal gland. Lacritin is characterized by its role in promoting human corneal epithelial cell proliferation and stimulating the production of tears. Lacritin was discovered to have antimicrobial activity against <i>Escherichia coli</i> . Deletion mutagenesis of recombinant Lacritin has shown that the antimicrobial activity in the micromolar concentration range is localized to a domain between amino acids 80 and 119. This region of mature Lacritin contains a cationic amphipathic alpha helix within the C-terminal; a secondary structure common to many antimicrobial proteins and hypothesized to be critical for antimicrobial activity. Recombinant Lacritin's antimicrobial activity is bactericidal and offers a new approach to treating and preventing microbial infections of the ocular surface. 
Presenter: -Erin V. Coleman Biotechnology Major Honors Thesis (ISAT 499C)	
Presentation No.: 09-09S	
Thesis Advisor: Dr. Robert McKown	
External Sponsor: This research was supported by grant funding from Virginia's Commonwealth Health Research Board and NIH RO1 EY013143	

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: *Conformational Analysis of Recombinant Lacritin Variants*

Presentation Time:

1:30 – 1:55 p.m.

Presenter:

-Morgan Kimberly
Biotechnology Major
(ISAT 493)

Presentation No.:

24-09S

Thesis Advisor:

Dr. Robert McKown

External Sponsor:

This research was supported by grants NIH RO1 EY013143 and NIH R42 EY015376.

Thesis Abstract:

Lacritin is a secreted human tear protein that stimulates new tear production, promotes new cell growth, and is antimicrobial. Deletion analysis has revealed that an amphipathic alpha helical region in lacritin's C-terminus is necessary for activity. A set of lacritin variants were created by site-directed mutagenesis targeting specific amino acids in the amphipathic alpha helical region. The recombinant variants were purified and analyzed by circular dichroism spectroscopy. Spectral analysis of lacritin variants (0.5 mg/ml in phosphate buffer) in increasing temperatures and solvent concentrations was studied using a Jasco J-810 spectropolarimeter with CD Pro Software .



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: <i>Characterization of an Unknown Lacrimal Gland Secretory Protein</i>	
Presentation Time: 2:00 – 2:25 p.m.	Thesis Abstract: The human tear film is a complex layer of fluid that provides protection and lubrication to the ocular surface. Proteomic analysis has identified over 400 proteins in tear fluid revealing a protein complexity far greater than previously appreciated (Laurie et al. 2008). Although many of the tear proteins have been characterized by tissue or cell type expression and by functional sequence homology, the role played by most of these proteins in tear film is largely unknown. A strategy was developed to identify a subset of tear proteins for molecular and biochemical analysis. Selection criteria were expression in the lacrimal gland, extracellular secretion, and an ordered secondary structure. 10 candidates were identified and one was selected for cloning, expression, and purification.
Presenter: -Michael T. Martin Biotechnology Major Honors Thesis (ISAT 499C)	
Presentation No.: 39-09S	
Thesis Advisor: Dr. Robert McKown	
External Sponsor: This research was supported by grants NIH RO1 EY013143 and NIH R42 EY015376.	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2

ISAT/CS – ROOM 148

Thesis Title: *Preparation of the CoRPS (City of Richmond Progression in Science) Program to link ISAT Graduate Students to Virginia High Schools.*

Presentation Time:

2:30 – 2:55 p.m.

Presenter:

-Kathryn Kogge
ISAT Major (ISAT 493)

Presentation No.:

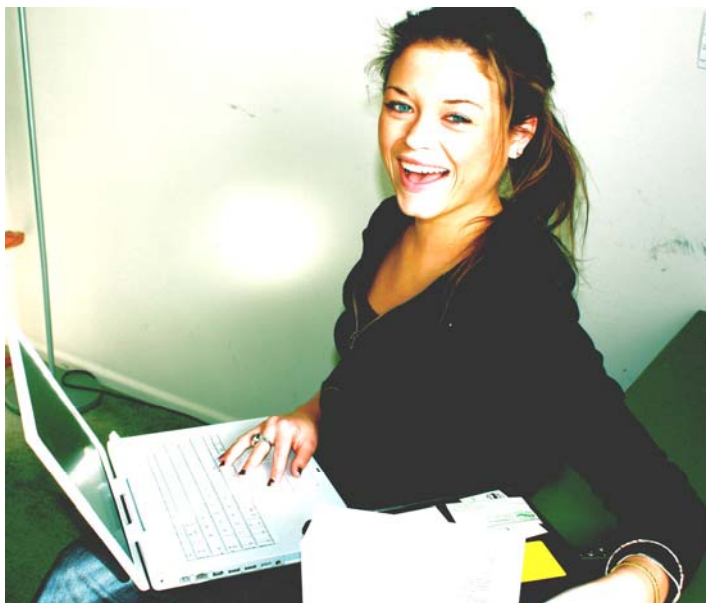
25-09S

Thesis Advisor:

Dr. Cindy Klevickis

Thesis Abstract:

Each year, the National Science Foundation awards grants to graduate programs in STEM fields with the understanding that they will have a positive impact on needy K-12 schools in their area. The Masters Program for ISAT is an ideal candidate for such a program and the need for reform in middle and high school science education is evident in various Richmond city schools. The CoRPS Program would bring 12 ISAT Graduate fellows to two high schools and two middle schools in Richmond and would give students and teachers there a chance to learn in a hands-on, interactive environment. With a focus on Chemistry and Physics in the natural world, this Environmental Science program would not only assist the Richmond school district, but the graduate fellows would also receive scholarship funding for their studies at James Madison University. It takes a collaborative effort to bring this all together, but the foundation of the ISAT program is built on communication and combining differing backgrounds of knowledge. The grant proposal is due in June of this year.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: *Montessori Education in Haiti and Proposal for Foundation Collaboration*

Presentation Time:

3:00 – 3:25 p.m.

Presenter:

-Alyssa Gaughen
ISAT Major (ISAT 493)

Presentation No.:

13-09S

Thesis Advisor:

Dr. Cindy Klevickis

Thesis Abstract:

In order to create long term hope for prosperity in Haiti, the poorest country in the Western Hemisphere, there need to be initiatives focusing on education. In addition to creating long-term stability, educating the youth is an effective way to help the country for future generations. Montessori education is an effective way of teaching children to help them gain confidence in themselves and in their intelligence. Montessori education supports creative thinking, peaceful interaction with others, and positive support of children's intellectual and emotional development. By proposing the collaboration between two existing Montessori foundations, I am confident that their combined efforts will complement JMU's current Haiti projects and help free future generations from the poverty the Haitians currently experience.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: <i>The Effects of the Iodine Fuming Application on DNA from Fingerprints</i>	
Presentation Time: 3:30 – 3:55 p.m.	Thesis Abstract: Today, deoxyribonucleic acid (DNA) is a vital asset in courtrooms across the world. DNA can make or break convictions, which is why it is important for investigators to have the necessary tools and knowledge to collect evidence. Extracting DNA from fingerprints is a fast growing practice that allows investigators to create DNA profiles from fingerprints alone. The purpose of this project is to investigate the effects of the iodine fuming application, used to identify latent fingerprints at a crime scene, have on DNA. The original goal of this experiment was to examine fingerprints on porous surfaces and identified by the use of the iodine fuming application, but due to the high costs of DNA analysis no results were found.
Presenter: -James Curry ISAT Major (ISAT 493)	
Presentation No.: 10-09S	
Thesis Advisor: Dr. Steven Frysinger	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: *Effect of Carbohydrate-Protein Supplementation during Endurance Exercise on Muscular Strength Immediately Following Exercise*

Presentation Time:

4:00 – 4:25 p.m.

Presenter:

-Brendan Regan
ISAT Major (ISAT 493)

Presentation No.:

31-09S

Thesis Advisor:

Dr. David Wenos

Thesis Abstract:

The emergence of carbohydrate plus protein onto the sports drink market challenged the long held belief that sports drinks containing only carbohydrates and electrolytes were optimal for enhancing performance. Studies conducted with endurance athletes drinking carbohydrate-protein (4:1) sports drinks have shown improved re-hydration, extended endurance, reduced muscle damage, and quicker onset of muscle recovery compared to athletes drinking carbohydrate only sports drinks. In this study participants from the JMU and Harrisonburg cycling community performed two trials cycling at 75% VO₂ max at 60 rpm for one hour followed by isokinetic strength testing of leg extension and leg flexion. Trials were randomized where each cyclist ingested 600 mL of a carbohydrate sports drink during one trial, and 600 mL of a carbohydrate-protein sports drink during the other. The peak torque to body weight and average power will be used to determine the effect of carbohydrate-protein supplementation during exercise on muscular strength following exercise.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 2 ISAT/CS – ROOM 148

Thesis Title: *Initial Patient Data Analysis of the Harrisonburg Community Health Center*

Presentation Time:

4:30 – 4:55 p.m.

Presenter:

-Briana Webber
ISAT Major (ISAT 493)

Presentation No.:

38-09S

Thesis Advisors:

-Dr. David Cockley
-Mr. Christopher Nye

Thesis Abstract:

This senior thesis will look at patient utilization data from the Harrisonburg Community Health Center for the year 2008, which was its first year in operation. The information analyzed includes the diagnoses the patients received, the average number of visits to the health center from each patient, and user demographic data. The information was used to determine trends in medical issues in the Harrisonburg area and how the Harrisonburg Community Health Center can better serve the Harrisonburg community. Analyzed trends and recommendations for service modifications will be made to the Harrisonburg Community Health Center Board of Directors and Executive Director.



AGENDA - 2009 Senior Thesis Project Presentations


TRACK 3 ISAT/CS – ROOM 150

Thesis Title: <i>Nanotechnology in Cosmetics: An Investigation of Nanotechnology in Personal Care Products</i>	
Presentation Time: 10:00 -10:25 a.m.	Thesis Abstract: Nanotechnology is currently being used in personal care products and is available on the market for consumers. The use of nanotechnology in cosmetics is a concern to many people due to the lack of testing and the potential effects on human health. The Campaign for Safe Cosmetics is a national coalition that is raising consumer awareness and is working to create stronger regulations for cosmetics. This project investigates cosmetics within society, their past and present regulations, and how nanotechnology is being used in cosmetic development today. This information is used to create brochures and other informational material for The Campaign for Safe Cosmetics in order to inform consumers about the lack of regulation and safety issues in regards to nano-cosmetics.
Presenter: -Katharine E. Oteiza ISAT Major (ISAT 493)	
Presentation No.: 28-09S	
Thesis Advisor: Dr. Jeffrey Tang	
External Sponsor: The Campaign for Safe Cosmetics	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 ISAT/CS – ROOM 150

Thesis Title: <i>Super Mileage</i>	
Presentation Time: 10:30 - 11:10 a.m.	Thesis Abstract: This senior project was focused on the design and construction of an ultra-high mileage single-passenger vehicle. The car was built in accordance with the rules for the Society of Automotive Engineers (SAE) Supermileage vehicle contest, with the intention of entering next year's competition. The project addresses the potential to greatly increase fuel efficiency in a well-engineered automobiles. Through the utilization of light weight materials, high aerodynamics, low rolling resistance, proper transmission gearing, and efficient engine combustion the team was able to create a vehicle that both performed well and looked visually pleasing. The vehicle is a low profile three wheel single-passenger car that is constructed of carbon fiber and aluminum; it boasts street bicycle racing wheels and a 3.5 hp Briggs & Stratton engine that was converted to fuel injection. 
Presenters: -Jacob Herbert -Brian Riggs -Scott Staley ISAT Majors (ISAT 493)	
Presentation No.: 17-09T	
Thesis Advisor: Dr. Chris Bachmann	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 ISAT/CS – ROOM 150

Thesis Title: <i>An Options Analysis of Transportation Fuels for Tangier Island, Virginia</i>	
Presentation Time: 11:45 - 12:10p.m.	Thesis Abstract: The aim of this project is to explore alternatives to petroleum for transportation purposes and investigate how they might be applied on Tangier Island, Virginia. For successful timely implementation, a solution should be economically feasible, technologically available, environmentally friendly, renewable in a realistic time frame, and easily integrated into the existing infrastructure. Tangier Island was deemed a suitable test location for this project as it is a small community with an existing modern transportation structure and definite boundaries. An options analysis was conducted and it was concluded that the most timely and realistic alternative would be to purchase biodiesel locally from a producer and have it shipped to the island. The results of this study will be considered in conjunction with other renewable energy projects focused on Tangier, with the ultimate goal of helping the island become a completely sustainable community that can be used as a model for the rest of the country.
Presenter: -Emily Thomas ISAT Major Honors Thesis (ISAT 499C)	
Presentation No.: 34-09S	
Thesis Advisors: Dr. Chris Bachmann	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 ISAT/CS – ROOM 150

Thesis Title: *Installation and Analysis of a Photovoltaic System on Keezletown Elementary School*

Presentation Time:

1:00 – 1:25 p.m.

Presenter:

-Jacob Torok
ISAT Major (ISAT 493)

Presentation No.:

35-09S

Thesis Advisor:

Dr. Tony Chen

External Sponsor:

John Hall, President
Endless Horizons

Thesis Abstract:

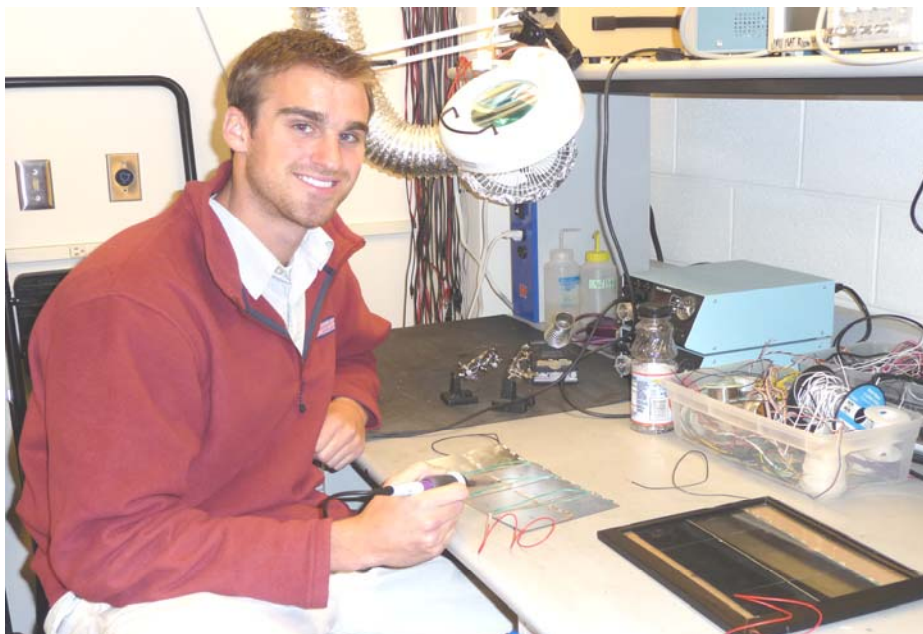
Photovoltaic technology has been in existence for over 30 years, but is just now becoming a competitive electricity source. The cost is quickly dropping, but there is still much debate as to the viability of this technology at this point in time. This project consisted of the design, installation and assessment of a 12.3 kW Photovoltaic system installed on Keezletown Elementary School. This was completed in order to determine the current cost effectiveness of small-scale PV systems, as well as to assess the advantages and disadvantages of this technology. This PV system will also be implemented into the school's curriculum and be used as a hands-on educational tool.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3

ISAT/CS – ROOM 150

Thesis Title: : <i>Improvement of Energy Photovoltaic Lab with Ultrahigh Efficiency Cells</i>	
Presentation Time: 1:30 – 1:55 p.m.	Thesis Abstract: Enormous progress has been made in recent years on a number of photovoltaic materials and devices in terms of conversion efficiency and cost. Nevertheless, in recent years the ISAT program has been using ordinary efficiency photovoltaic cells to conduct laboratory experiments in both ISAT 212 and 301 labs. With a grant of \$1,000 from JMU CISAT Dean's Office, this project focuses on researching and understanding the fabrication processes of low-cost dye-sensitized nano-structure single crystal silicon solar cells. A total 56 high-efficiency of such solar cells were purchased in order to update these labs. Seven modules were fabricated and performance testing was completed to test the efficiency of these new solar modules. Also, intensive research was done on testing procedures for these new, high efficiency photovoltaic cells. Upon completion of the performance testing and thorough research, the ISAT Photovoltaic Labs would be updated to provide future ISAT students with up-to-date technology in the solar cell industry.
Presenter: -Scott Regan ISAT Major (ISAT 493)	
Presentation No.: 41-09S	
Thesis Advisors: -Mr. Joseph Rudmin -Dr. Tony Chen	
External Sponsor: JMU CISAT Dean's Office Mini-Grant	
	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 ISAT/CS – ROOM 150

Thesis Title: <i>The Future of Fuel: Switchgrass Based Cellulosic Ethanol</i>	
Presentation Time: 2:00 – 2:40 p.m.	Thesis Abstract: Currently the majority of the U.S. ethanol production comes from the use of corn as a feedstock. Unfortunately corn has been found to be an inferior, less efficient feedstock source which has limited long term potential in the alternative fuels market. This project provides a look into the next generation of alternative fuels. Cellulosic ethanol presents a promising solution for the next step towards reducing America's fossil fuel dependency. Through a feasibility study, the potential for switchgrass as a large scale biomass source for ethanol production was determined. The study entailed research of current pretreatment procedures, various experimental processes and their subsequent yields. In addition, an analysis of the economic, environmental, and social implications of the technology was conducted with regards to its future integration potential into the U.S. infrastructure.
Presenters: -Daniel Hill -Patrick Macko -Michael Reed ISAT Majors (ISAT 493)	
Presentation No.: 18-09T	
Thesis Advisor: Mr. Paul Goodall	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 ISAT/CS – ROOM 150

Thesis Title: <i>Incentivizing Energy Conservation in Student Housing</i>	
Presentation Time: 2:45 – 3.10 p.m.	Thesis Abstract: The residential sector is the largest consumer of electricity in the United States, accounting for 36% of all electricity consumption. It is the objective of this research to eliminate a barrier to energy conservation by addressing the lack of transparency in utility allowance billing systems used by some student housing complexes. Utility allowances bundle a fixed monthly cost for utilities with the tenants rent. This system provides no feedback to the tenant on actual electricity consumption patterns and provides no incentives for efficient energy utilization. The research intends to initiate a new system that would provide incentives to make conscientious efforts to conserve energy while still providing the convenience of a single monthly payment.
Presenter: -Kevin Hofmaenner ISAT Major (ISAT 493)	
Presentation No.: 19-09S	
Thesis Advisor: Dr. Maria Papadakis	
External Sponsor: American Public Power Association's Demonstration of Energy-Efficient Developments (DEED)	
	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 ISAT/CS – ROOM 150

Thesis Title: *Developing an Energy Baseline for the JMU Residence Halls*

Presentation Time:

3:15 – 3:55 p.m.

Presenters:

-Bryce Bailey

-Amy Ciulla

-Barry Dai

ISAT Majors (ISAT 493)

Presentation No.:

04-09T

Thesis Advisor:

Dr. Maria Papadakis


Thesis Abstract:

This project is designed to help JMU's Office of Residence Life implement an energy management system. We consolidated, organized, and analyzed energy and water data for each of JMU's residence halls, evaluated consumption patterns and established performance benchmarks. Based on patterns of energy use, we also suggested improvements to increase energy efficiency. We finally entered data for each of the residence halls in the Environmental Protection Agency's Energy Star Portfolio Manager to determine which dorms may qualify for Energy Star certification and to track building performance in the future. Overall, this project aims to make the JMU campus more energy conscious in order to save money and preserve our natural resources.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 3 ISAT/CS – ROOM 150

Thesis Title: <i>Sustainable Engineering and Development</i>	
Presentation Time: 4:00 – 4:40 p.m.	Thesis Abstract:  <p>This project assessed the sustainability and economic feasibility of the integrated residential systems incorporated into the “Freedom House” just North of Harrisonburg, VA. The systems include a rain water catchment for potable water, a solar thermal hot water supply, a grid connected photovoltaic system, solar orientation for passive heating, a geothermal heat pump, and a biological filter wastewater treatment system with a greenhouse. Our objectives included monitoring all of these systems, evaluating their environmental and economic impact, and making recommendations for improvement and optimum solutions for replication in other homes. We found that the geothermal heat pump was the most effective. The other systems were positive supplements to the house; however, they did not enable the house to function in a fully sustainable way.</p>
Presenters: -Briana Carper -Allison Truglio ISAT Majors (ISAT 493)	
Presentation No.: 08-09T	
Thesis Advisor: Dr. Wayne Teel	
External Sponsor: Mr. Zach Fettig, Shenandoah Sustainable Technologies	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: <i>Driver's Environmental Education: A Two-Hour Workshop</i>	
Presentation Time: 8:00 – 8:40 a.m.	Thesis Abstract: The goal of this project was to develop a 2-hour educational module covering vehicle maintenance and driving behaviors that minimize fuel consumption and emissions. This project was motivated by the fact that fuel conservation education was officially adopted into Virginia high school driver's education classes by the Virginia Department of Education; however, supporting materials were not developed due to a lack of funding. Although the target audience for this project was the JMU community, it is anticipated that follow-on projects will adapt the material to the high school level. The module I developed contained a teachers' manual as well as lesson materials for classroom instruction. The hands-on curriculum connected driver's education with science, technology, and mathematics concepts. Information collected for this project came from an array of sources including books, research monographs, expert Senate testimony, and other source material that could be used to create informational and educational components. The module was pilot tested on a diverse group of drivers, and participants were surveyed regarding any change in behavior.
Presenter: -Andrew Brautigan ISAT Major (ISAT 493)	
Presentation No.: 40-09S	
Thesis Advisor: Dr. Christie-Joy Brodrick Hartman	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: *Developing Surface Water Purification Technology and a Water Hygiene Education System for the African Community of Namawanga, Kenya*

Presentation Time:

9:00-9:40a.m.

Presenters:

-Coryn Giordano
-Christa Murray
ISAT Majors (ISAT 493)

Presentation No.:

15-09T

Thesis Advisor:

Dr. W. Gene Tucker

External Sponsor:

Least of These,
International

Thesis Abstract:

The goal of this senior project is to help improve the quality of life in Namawanga, Kenya through innovative water purification technologies. Water borne diseases are responsible for poor quality of life and many premature deaths. In order to treat these diseases, it is necessary to properly treat their surface water supply. Least of These International is a non-profit organization dedicated to providing sustainable solutions to problems including water quality. With their guidance and knowledge of the community, we tested and analyzed three design recommendations of water purification technologies: biosand filtration, moringa oleifera treatment, and ceramic filtration. Considering various factors such as practicality, feasibility, appropriate materials, and cost, we chose the most appropriate technology for Namawanga. We also developed an educational model that addresses water hygiene and sanitation for the village to emphasize the importance of clean water.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: <i>Pilot Scale Removal of Manganese from Water by Ozone Treatment</i>	
Presentation Time: 9:45 – 10:10 a.m.	Thesis Abstract: Acid mine drainage contains high concentrations of dissolved metals, especially iron and manganese. Using an innovative technique developed by the USGS in 2002 to remove dissolved metals, contaminated water is pumped into a 345-gallon continuously stirred flow reactor where ozone gas is injected into the system; the ozone gas oxidizes the dissolved metals forming a solid oxide precipitate that can then be filtered and removed from the water. The amount of ozone injected into the water is controlled by monitoring the oxidation reduction potential of the water solution. This project aims to develop a more complete understanding of how the system operates, how to optimize its performance with respect to precipitating manganese, and to investigate the economic feasibility of using this system for commercial applications.
Presenter: -Jeffrey S. Turner ISAT Major Honors Thesis (ISAT 499C)	
Presentation No.: 36-09S	
Thesis Advisor: Dr. W. Gene Tucker	
External Sponsor: U.S. Geological Survey JMU Honors Program	



AGENDA - 2009 Senior Thesis Project Presentations


TRACK 4 ISAT/CS – ROOM 348

Thesis Title: <i>ElectroMagnetic Shock Absorber (EMSA)</i>	
Presentation Time: 10:15-10:55a.m.	Thesis Abstract: This project is based on harvesting otherwise wasted energy from the movement of the suspension in an automobile or other vehicle. The E.M.S.A. team disassembled an AFCO standard racing shock absorber and attached a super magnet to the shock piston. The shock housing was then wrapped in wire to create a linear generator. As the piston and attached super magnet move back and forth past the wire coils a current is induced in the wire. A testing apparatus and a measurement system were designed and built in order to take voltage measurements from the device while simulating the actuation of a shock absorber on a vehicle traveling down the road. The goal is to investigate what is possible in harvesting this wasted energy source and make it available to the electrical systems of the vehicle. This kind of technology has the capability of prolonging the charge on the batteries so that the frequency of charges is reduced.
Presenters: -Ben Artale -Jason Atkins -Chris Trimble ISAT Majors (ISAT 493)	
Presentation No.: 02-09T	
Thesis Advisor: Dr. Robert Prins	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: <i>Indian Spring Wetlands Park Restoration Plan</i>	
Presentation Time: 11:00 – 11:40 a.m.	Thesis Abstract: Indian Spring is a one acre property that is classified as a wetland area and is owned by the town of Woodstock. The objective of our project is to create a comprehensive plan for turning the Indian Spring Wetlands into a public park with an observation deck and signage with an educational emphasis on local history and the preservation of wetlands. The plan includes budget suggestions, opportunities for grants and funding, ideas for enhancing an adjacent detention pond, developing community involvement and partnerships, and creating text for signage on the property with the assistance of JMU's Communication, Environment and Environmentalism class. The project will be presented to the Woodstock Tree Board, who will decide on and implement an appropriate plan for the wetlands. 
Presenters: -Katherine A. Shepard -Lindsay M. Wolfendale ISAT Majors (ISAT 493) Communication, Environment and Environmentalism Class Members: Pete Bsumek -Advisor - Katlyn Karnes - (SCOM) - Doug McAdoo - (SCOM) -Jessica Schultz – (SMAD) - Jeremy Stone - (SCOM)	
Presentation No.: 37-09T	
Thesis Advisor: Dr. Maria Papadakis	
External Sponsor: Town of Woodstock Tree Board, Woodstock, Virginia	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: *Design and construction of a rain garden for improvement of stormwater management.*

Presentation Time:

1:00 – 1:25 p.m.

Presenter:

-Brian Alexander
ISAT Major (ISAT 493)

Presentation No.:

01-09S

Thesis Advisor:

Dr. Mary Handley

External Sponsor:

Northampton
County Public Schools

Thesis Abstract:

As urban development increases in the Chesapeake Bay watershed region, pollution levels entering the Chesapeake Bay through stormwater runoff are going to increase. Rain gardens are bioretention areas designed to capture and absorb excess rainfall after landing on impervious surface areas such as rooftops or parking lots to restore water cycle balance and reduce stormwater runoff. A rain garden was built at Occohannok Elementary School in Exmore, Virginia in the Chesapeake Bay watershed region. By building a rain garden flooding is reduced at the site, pollutants are filtered from the water, and water is recharged to the earth before it can enter the Chesapeake Bay tributary system. The purpose of this project was to raise awareness as to how human development affects local ecosystems while giving teachers an environmental science resource, and also to serve as a model for those who choose to implement a rain garden of their own in the local community.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: *Design and Construction of a Wooded Wetland Area for Stormwater Remediation at the Future Rockingham Memorial Hospital Site*

Presentation Time:

1:30 – 2:10 p.m.

Presenters:

-Nicolas Jaramillo

-Bonnie Tang

ISAT Majors (ISAT 493)

Presentation No.:

20-09T

Thesis Advisor:

Dr. Wayne Teel

External Sponsor:

Rockingham Memorial
Hospital and Cacapon
Institute

Thesis Abstract:

Dennis Coffman, Director of Facilities Planning and Development, from Rockingham Memorial Hospital (RMH) approached Professor Teel in hopes of getting aid from interested JMU students on the implementation of an Supplemental Environmental Project (SEP) with a budget of \$12,700 at the new RMH site. We found that Pleasant Run, a stream branching off the North River, starts at the lowest point of the new RMH property. We decided that a sustainable biological system to filter runoff water before it would reach Pleasant Run would prove best for this project. In order to slow the runoff flow we designed and installed two berms that increase the meander of the stream. Around these meanders we planted around 500 trees, and plan to install a deer fence that will protect them from browse damage.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: <i>Feasibility Analysis of Anaerobic Digestion for Refrigeration in Namawanga, Kenya</i>	
Presentation Time: 2:15 – 2:55 p.m.	Thesis Abstract: Three James Madison University undergraduate students, advised by their faculty mentors, conducted a feasibility analysis of installing an anaerobic digester in Namawanga, Kenya. The Namawanga community has implemented a dairy co-op, but this requires refrigeration before selling milk to local markets. The cattle manure from the dairy co-op animals will serve as the feedstock for the digester, and the resulting biogas will be used to run an absorption refrigerator for the storage and future sales of milk. The feasibility study addresses the unique social, economic and environmental conditions of Namawanga, Kenya.
Presenters: -Doug Geiger -Kyle Kinnally -Dan Levitt ISAT Majors (ISAT 493)	
Presentation No.: 14-09T	
Thesis Advisors: -Dr. Wayne Teel -Dr. Jeffrey Tang	
External Sponsor: Least of These International	
	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: <i>Mini-Hydro Electric Power plant</i>	
Presentation Time: 3:00 – 3:25 p.m.	Thesis Abstract: This project seeks to develop low head mini hydroelectric power generation through the use of an artificially induced gravitational vortex. The project, currently in bench scale testing, is planned for the pilot scale model under the direction of James Deskins and Donald Gleason on site on Smith Creek at Lacey Springs, Virginia. Total reclamation of the water, lower temperatures, aeration of the water, and significant power production are expected benefits of the project. This project emphasizes many aspects of the ISAT program mainly environmental stewardship, alternative energy production and engineering and manufacturing concepts.
Presenter: -James Deskins ISAT Major (ISAT 493)	
Presentation No.: 11-09S	
Thesis Advisor: Dr. Thomas Benzing	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: *Monitoring Water Temperature to Identify Streams for Native Brook Trout Restoration*

Presentation Time:

3:30 – 4:10 p.m.

Presenters:

-Gordon Johnson

-Brad Sullivan

ISAT Majors (ISAT 493)

Presentation No.:

22-09T

Thesis Advisor:

Dr. Thomas Benzing

External Sponsor:

Trout Unlimited


Thesis Abstract:

Brook trout are native to the Shenandoah Valley but have suffered from a significant loss of the coldwater stream habitat to which they are adapted. A local chapter of Trout Unlimited, a conservation organization, is hoping to restore brook trout to some of their historic range in Augusta County. We monitored water temperatures along a reach of the South River near Waynesboro and several spring creeks in Augusta County. We took temperature measurements over the summer for about three months using iButton® sensors that were encapsulated to ensure the hardware wouldn't be damaged by the water. In analyzing our temperature data, we compared daily temperature maxima and averages to literature values of trout tolerance limits. We found that the South River sections near the springs maintained summertime temperatures that would support brook trout well within their tolerance limits. Monitoring stations in Goose Creek, Long Meadow Run, and along South River upstream of Lipscomb Road reached summertime temperatures that were too warm to support trout.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 4 ISAT/CS – ROOM 348

Thesis Title: <i>CISAT Rain Garden</i>	
Presentation Time: 4:15 – 4:40 p.m.	Thesis Abstract: James Madison University is located in the Chesapeake Bay watershed; the proposed project will be to address the storm water management practices on campus in order to have a more positive impact on the local watershed. The plan is to implement a bioretention system that will help decrease the environmental footprint left by stormwater on campus. The proposed rain garden will trap and filter sediment, excess nutrients, and parking lot run off before it reaches the watershed. JMU is required to develop a Best Management Practice program (BMP) to define goals for storm water management. This project is intended to fulfill several of the goals listed in this plan including; post-construction storm water management, pollution prevention, and public education in regards to the impacts of storm water. 
Presenter: -Chantell Lace Phillips ISAT Major Honors Thesis (ISAT 499C)	
Presentation No.: 29-09S	
Thesis Advisors: -Dr. Thomas Benzing -Dr. Maria Papadakis -Dr. Eric Pappas	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: *Implementing Radio Frequency Identification (RFID) Technology to Airline Baggage Tracking for Aer Lingus*

Presentation Time:

10:00 – 10:25 a.m.

Presenter:

-Steven McCarthy
ISAT Major (ISAT 493)

Presentation No.:

26-09S

Thesis Advisor:

Dr. Geoffrey Egekwu

External Sponsor:

Hector Eleftherion – Aer Lingus

Thesis Abstract:



The goal of this study is to produce a feasibility assessment for implementing an RFID baggage and cargo tracking system into Aer Lingus' network of airports. Problems with the current system, types of available RFID technologies, areas of implementation, cost-benefit analyses, and development of a finished system for use in Aer Lingus' daily operations will be addressed in this project. The project will yield plans to integrate a complete RFID tracking system for immediate use for passenger baggage and commercial cargo in Aer Lingus' route network across the globe.

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: <i>Development of a Search and Rescue Robot for Use in Local Safety Departments</i>	
Presentation Time: 10:30 – 11:10 a.m.	Thesis Abstract: Search and rescue robots were first introduced to the rescue community during the World Trade Center tragedy. Since then the Center for Robot-Assisted Search and Rescue has been working hard to further their inclusion in rescue efforts. Robots can be used to explore situations that may otherwise put a human in danger. Currently, the biggest obstacle in rescue robots is due to the limited understanding of human-robot interaction. As people develop a better understanding of robots and how they function, the robots will be able to be used in a larger variety of situations. Our project intends to increase the understanding of search and rescue robots by general managers in local safety departments and develop a simplified rescue robot for local use.
Presenters: -Chris Carper -Kristen Gains ISAT Majors (ISAT 493)	
Presentation No.: 11-09T	
Thesis Advisor: Dr. Mohamed Zarrugh	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: : *Backpack Mounted Kinetic to Electric Energy Conversion Unit Utilizing Faraday's Law of Magnetic Induction*

Presentation Time:
11:15 – 11:55 a.m.

Presenters:

-Michael Ashton
-Ryan Selkregg

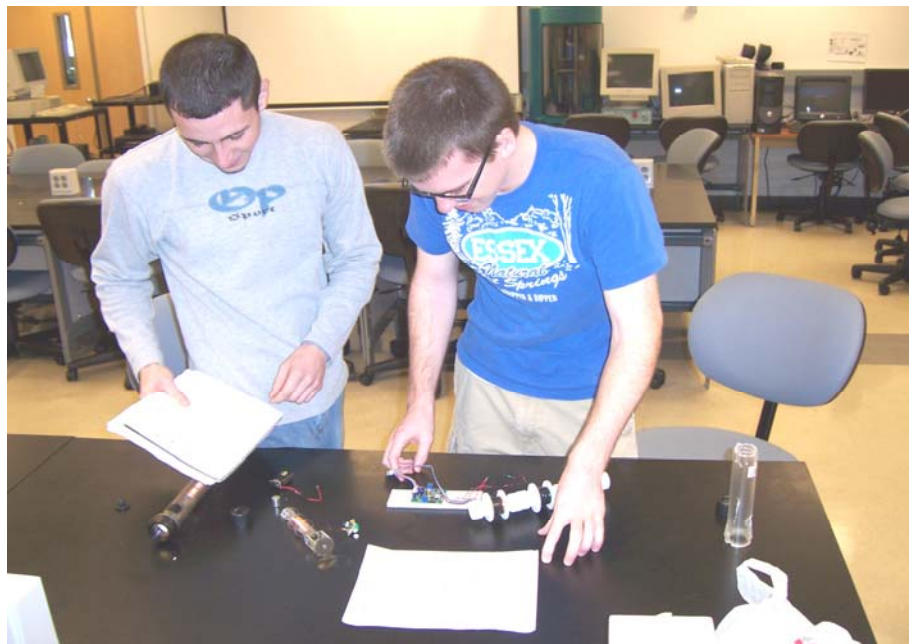
ISAT Majors (ISAT 493)

Thesis Abstract:

Our project focuses on the feasibility, design, and prototyping of a unit mounted inside a backpack which captures and converts the kinetic energy of the user to electrical energy which can be used to supply power to a variety of devices including cell phones, iPods, PDAs, and other small consumer electronics. The unit should remain small and light enough to allow for normal use of the backpack. The physical effect being used is Faradays Law of Magnetic Induction, which can be seen in other consumer products such as shake flashlights.

Presentation No.:
03-09T

Thesis Advisor:
Mr. James Ridings



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: *RoommateRoundup.com: Matching roommates based on compatibility, in the hands of the students*

Presentation Time:

1:00 – 1:40 p.m.

Presenters:

-Tony Hakes

-Kyle Heiman

ISAT Majors (ISAT 493)

Presentation No.:

16-09T

Thesis Advisor:

Dr. Morgan Benton


Thesis Abstract:

Roommate selection greatly impacts first-year college experience; an incompatible roommate can jeopardize a student's academic career. An extensive literature search followed by phone interviews with eight colleges' residence life offices established a wide range of methodologies for matching roommates—from random to personality testing to “matchmaker” to committee based assignments. Based upon this investigation a design for a web-based “best of breed” application for matching roommates was created and implemented. The system helps a student develop a profile based on lifestyle preferences—e.g. I do/don't smoke—and presents roommate options in a social-networking style similar to Facebook. The system was implemented using the Ruby on Rails framework and incorporates a MySQL database and the Dojo Toolkit javascript framework.



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: <i>Web-Based Automation for LOTI Capacity Factor Analysis Model</i>	
Presentation Time: 1:45 – 2:10 p.m.	Thesis Abstract: Using Ruby on Rails a web-based application was built to automate the selection of appropriate technologies for implementation in developing countries. Least of These International (LOTI), a not for profit company started by two ISAT graduates, sponsored the project. The system developed is based off of a Capacity Factor Analysis Model developed by LOTI (www.cfamodel.org). Communities are rated in eight areas called community capacity factors. LOTI has also rated several technologies on the same eight factors. The system compares the community capacity factors against the technologies factors. The system then returns the technologies that would fit best with the community. The system provides LOTI the ability to make their technology suggestion publicly available for community leaders. This enables more communities to seek sustainable technologies for their communities.
Presenter: -Michael McMahon ISAT Major (ISAT 493)	
Presentation No.: 27-09S	
Thesis Advisor: Dr. Morgan Benton	
External Sponsor: Least of These International	 A photograph of a man in a dark t-shirt pointing at a large interactive screen. The screen displays the 'CFA Model' interface, which includes a header with the text 'CFA Model' and 'CAPACITY FACTOR ANALYSIS'. The screen is mounted on a stand, and the man is standing to the left of it.

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: <i>Patient Tracking With RFID Technology</i>	
Presentation Time: 2:15 – 2:40 p.m.	Thesis Abstract: The purpose of this project is to track patients in a hospital setting by the use of radio frequency identification (RFID) technology. Patient safety in hospitals will always be a top priority, and through the use of RFID technology patients can be monitored and be treated more efficiently. By placing individual tags on patients and readers in key locations within a hospital, it is possible to track a patient's location at any given time. Our system is three-tiered and uses Visual Basic and ASP.NET to interface to a back-end SQL Server database. Upon arrival at a hospital, patients can be assigned to a unique RFID tag that will then be used to route and follow their movement through the hospital until they are released. Such a system could provide valuable logistical data which can increase efficiency and improve safety measures if implemented correctly.
Presenter: -Reece Johnson ISAT Major (ISAT 493)	
Presentation No.: 23-09S	
Thesis Advisor: Dr. Anthony A. Teate	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: <i>A campus-wide Wi-Fi based real-time location and tracking emergency alert system</i>	
Presentation Time: 2:45 – 3:25 p.m.	Thesis Abstract: In our studies, we researched current on-campus emergency alert systems in an attempt to find new ways to improve upon them. Our goal is to study small, wireless devices that can alert students in many ways, including light, sound, and vibration, in the event of an emergency. We will then use these devices to engineer a system that can send information to students located in specific areas of campus telling them to act in a ways that will assure they don't go to other areas deemed unsafe. After researching several technologies (e.g., RFID) we have determined one appropriate device, developed by Ekahau, Inc., is a small transceiver which uses the widely available campus Wi-Fi network and real-time location and tracking software. We are using these devices to create our real-time emergency alert system.
Presenters: -Cameron Emmart -Hai Nguyen ISAT Major (ISAT 493)	
Presentation No.: 12-09T	
Thesis Advisor: Dr. Anthony Teate	



AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: <i>DENGUE VIRUS TYPE 2: Expression of Non-pathogenic Viral pre-Membrane (prM) and Envelope (E) proteins in African Green Monkey Kidney (VERO) Cells</i>	
Presentation Time: 3:30 – 3:55 p.m.	Thesis Abstract: Approximately 2.5 billion individuals are currently at risk for Dengue Virus infection. Female mosquitoes, specifically <i>Aedes aegypti</i> and <i>Aedes Albopictus</i> , are intermediate hosts of Dengue Virus and transmit the disease to humans upon obtaining a blood meal. Individuals in sub-tropical and tropical regions are at elevated risk for infection due to the warm and wet climates that foster the life cycle of the mosquito vector. On the molecular level, the receptor responsible for enabling entry of the Dengue virion into the host cell is currently unknown. This project seeks to utilize the non-pathogenic structural proteins of Dengue Virus, Type 2, to improve knowledge of virus interaction with the host cell in order to advance diagnostic and therapeutic research. Dengue Virus DNA of structural proteins prM and E were cloned from pAC5.1/V5-HisA (C-prM-E/DV) vector into mammalian expression vector pCI with the addition of a c-Myc tag. Subsequently, prME proteins and c-Myc tag will be expressed in Vero cells. Western blot testing will be performed to confirm and localize protein expression using Anti-c-Myc antibodies. Future studies include isolation of lipid rafts, discrete domains of the Vero cell membranes likely to contain the prM and E proteins, to study the microenvironment in which the Dengue Virus structural proteins reside. In collaboration with SRI Shenandoah Valley Center for Advanced Drug Research (CADRE), proteomics will be used to study molecular interactions between the viral E protein and the unknown receptor on the host cell. <div data-bbox="584 785 1136 1444" data-label="Image"> </div>
Presenter: -Theresa Russo Biotechnology Major (ISAT 493)	
Presentation No.: 42-09S	
Thesis Advisor: Dr. Amanda Biesecker	

AGENDA - 2009 Senior Thesis Project Presentations

TRACK 5 ISAT/CS – ROOM 350

Thesis Title: <i>UMatter2Us - Collaborative Learning Management System</i>	
Presentation Time: 4:00 – 4:25 p.m.	Thesis Abstract: UMatter2Us is an online learning management system designed to emphasize choice and collaboration in support of student learning. The system fosters an altered balance of power between students and instructors. Instructors give up some control over the content, pace, and sequencing of material covered in a course. Students take ownership of their learning, using tools to engage in self and peer assessment as they work towards constructing a definition of what it means to produce “high quality” work. Traditional student assessment techniques are replaced by an integrated holistic assessment structure. Overall student performance is documented by means of a “learning paper trail.” Theoretically speaking, U Matter2Us supports a mastery learning paradigm within a social constructivist learning environment.
Presenter: -Thomas J. Fadoul III ISAT Major (ISAT 493)	
Presentation No.: 43-09S	
Thesis Advisor: Dr. Morgan Benton	



Congratulations to everyone!