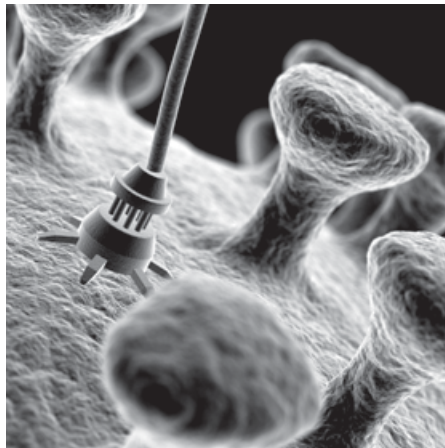
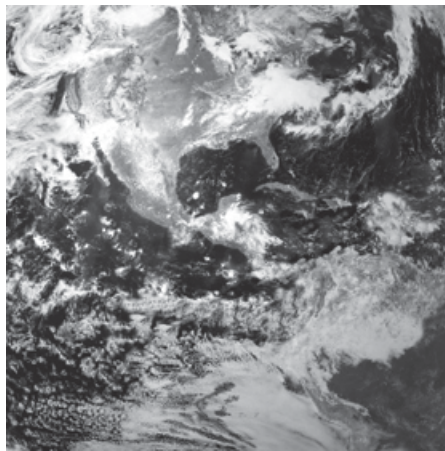


JAMES MADISON UNIVERSITY®

Department of Integrated Science and Technology

14th Annual

ISAT Senior Thesis Project Symposium



Friday, April 16, 2010

9:00 a.m. - 5:00 p.m.

ISAT/CS and

HHS Buildings

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ISAT Majors - Presenters in Alphabetical Listing

First Name	Last Name	Presentation Time	Presentation Location	Presentation Page #	Thesis Advisor
Ben	Akiyama	9:00-10:00am	ISAT-Room 148	24	Dr. Christopher Bachmann
Geoffrey	Austin	1:30-2:10pm	ISAT-Room 348	47	-Dr. Wayne Teel -Dr. Robert Prins
Caitlin	Baird	9:45-10:10am	ISAT-Room 136	17	-Dr. Rory DePaolis -Dr. David Cockley
Aaron	Ballew	10:30-11:10am	ISAT-Room 350	49	Dr. Mohamed Zarrugh
Jordan	Barker	9:30-10:10am	ISAT-Room 337	40	Dr. Emil Salib
Christopher	Brill	11:30-11:55am	ISAT-Room 348	45	-Dr. Steven Frysinger -Dr. Thomas Benzing -Dr. Morgan Benton
Abbaynesh	Bryant	10:30-10:55am	ISAT-Room 348	43	Dr. Thomas Benzing
Arthur	Burwell	1:00-1:40pm	ISAT-Room 350	50	Dr. Morgan Benton
Dane	Celnicker	4:20-4:50pm	ISAT-Room 136	23	Dr. Jeffrey Tang
Timothy	Clark	1:30-2:10pm	ISAT-Room 348	47	-Dr. Wayne Teel -Dr. Robert Prins
Paul	Crisman	11:30-12:10pm	ISAT-Room 148	26	Dr. Robert Prins
Krista	Croxton	10:30-10:55am	ISAT-Room 150	31	-Dr. Louise Temple -Dr. Stephanie Stockwell
Tanner	Cummings	3:10-3:40pm	ISAT-Room 136	22	Dr. Jeffrey Tang
John	Danko	9:00-10:00am	ISAT-Room 148	24	Dr. Christopher Bachmann
Brandon	Dick	1:30-2:10pm	ISAT-Room 348	47	-Dr. Wayne Teel -Dr. Robert Prins
Matthew	Feltz	12:15-12:40pm	ISAT-Room 148	27	Dr. Robert Prins
Vernita	Fisher	9:45-10:25am	ISAT-Room 350	48	Dr. Mohamed Zarrugh
Casey	Flanagan	1:30-2:30pm	ISAT-Room 159	38	Dr. Kenneth Lewis
Michael	Fedkenheuer	1:00-1:25pm	ISAT-Room 150	34	Dr. Amanda Biesecker
Steven	Florian	9:00-9:40am	ISAT-Room 350	48	Dr. Abdelrahman Rabie

ISAT Majors - Presenters in Alphabetical Listing

First Name	Last Name	Presentation Time	Presentation Location	Presentation Page #	Thesis Advisor
Ari	Giller-Leinwohl	11:00-11:25am	ISAT-Room 148	25	Dr. Robert Prins
Donald	Gleason	10:00-10:25am	ISAT-Room 348	42	Dr. Thomas Benzing
Andrew	Gronan	1:30-1:55pm	ISAT-Room 150	35	Dr. Jonathan Miles
Thomas	Haney	3:00-3:25pm	ISAT-Room 350	53	Dr. Morgan Benton
Lucas	Hauschner	10:30-11:10am	ISAT-Room 350	49	Dr. Mohamed Zarrugh
Christopher	Hawkins	3:50-4:15pm	ISAT-Room 136	23	Dr. Jeffrey Tang
David	Jacob	9:00-9:40am	ISAT-Room 136	16	Dr. David Lawrence
Heidi	Lindenfelser	9:30-9:55am	ISAT-Room 150	29	Dr. Ronald Raab
Robert	Loflin III	11:30-12:10pm	ISAT-Room 148	26	Dr. Robert Prins
Ryan	Luckay	11:15-11:55am	ISAT-Room 350	49	Dr. Mohamed Zarrugh
Michelle	Madey	9:00-9:25am	ISAT-Room 150	28	Dr. Ronald Raab
John	Marier	1:30-2:10pm	ISAT-Room 348	47	-Dr. Wayne Teel -Dr. Robert Prins
William	McCoy	9:45-10:25am	ISAT-Room 350	48	Dr. Mohamed Zarrugh
Matthias	Miller	9:00-9:40am	ISAT-Room 136	16	Dr. David Lawrence
Nicholas	Moran	10:30-11:10am	ISAT-Room 350	49	Dr. Mohamed Zarrugh
Daniel	Morgan	4:20-4:50pm	ISAT-Room 136	23	Dr. Jeffrey Tang
Linda	Nguyen	2:00-2:40pm	ISAT-Room 150	36	Dr. Tony Chen
Rachel	Palmquist	2:30-2:55pm	ISAT-Room 350	52	Dr. Morgan Benton
Corinn	Pope	2:45-3:10pm	ISAT-Room 150	37	Dr. Maria Papadakis
David	Ramsey	1:45-2:25pm	ISAT-Room 350	51	Dr. Morgan Benton
Brian	Rapp	1:45-2:25pm	ISAT-Room 350	51	Dr. Morgan Benton
John	Real	2:00-2:40pm	ISAT-Room 150	36	Dr. Tony Chen
Patrick	Reiser	3:15-3:40pm	ISAT-Room 150	37	Dr. Maria Papadakis
Andrew	Robert	2:15-2:40pm	ISAT-Room 348	47	Dr. Wayne Teel

ISAT Majors - Presenters in Alphabetical Listing

First Name	Last Name	Presentation Time	Presentation Location	Presentation Page #	Thesis Advisor
David	Roy	9:00-10:00am	ISAT-Room 148	24	Dr. Christopher Bachmann
Christina	Ruiz	10:00-10:25am	ISAT-Room 150	30	Dr. Ronald Raab
Spencer	Sayce	10:45-11:25am	ISAT-Room 337	41	Dr. Emil Salib
Patrick	Seal	9:00-9:25am	ISAT-Room 337	39	Dr. Emil Salib
Colton	Shaver	11:00-11:25am	ISAT-Room 150	32	Dr. Louise Temple
Lisa	Shinkarow	11:30-11:55am	ISAT-Room 150	33	Dr. Louise Temple
Will	Shoemaker	9:00-9:40am	ISAT-Room 350	48	Dr. Abdelrahman Rabie
Alexander	Sonifrank	11:15-11:55am	ISAT-Room 350	49	Dr. Mohamed Zarrugh
Gregory	Steinmeyer	10:45-11:25am	ISAT-Room 337	41	Dr. Emil Salib
Randall	Swartz	9:00-9:40am	ISAT-Room 136	16	Dr. David Lawrence
Samuel	Sweet	11:30-12:10pm	ISAT-Room 148	26	Dr. Robert Prins
Carl	Taylor	1:00-1:25pm	ISAT-Room 348	46	Dr. Wayne Teel
Andrew	Theodosakis	11:00-11:25am	ISAT-Room 150	32	Dr. Louise Temple
Cyril	Thornton	9:30-10:10am	ISAT-Room 337	40	Dr. Emil Salib
Michael	Trop	11:00-11:25am	ISAT-Room 348	44	Dr. Thomas Benzing
Nathaniel	Walker	3:10-3:40pm	ISAT - Room 136	22	Dr. Jeffrey Tang
Christopher	White	10:45-11:25am	ISAT-Room 337	41	Dr. Emil Salib
Darrin	Whitley	1:00-1:40pm	ISAT-Room 350	50	Dr. Morgan Benton
Evan	Williams	10:15-10:40am	ISAT-Room 337	40	-Dr. Emil Salib -Dr. Jonathan Miles
Daniel	Yeh	9:00-10:00am	ISAT-Room 148	24	Dr. Christopher Bachmann

Information Analysis (IA) Majors - Presenters in Alphabetical Listing

ISAT –ROOM 136 – Instructor – Dr. Jeffrey Tang

First Name	Last Name	Presentation Time	Presentation Page #
Ahmed	Ali	2:35-3:00pm	21
Rebecca	Brown	10:15-10:45am	18
Bree	Edwards	1:40-2:00pm	20
Jamie	Ferron	10:50-11:10am	18
Leigh	Ferraro	10:15-10:45am	18
Matt	Gibson	2:35-3:00pm	21
Justin	Godby	11:40-12Noon	19
Kyle	Kubin	2:05-2:30pm	21
Rob	Marsh	1:00-1:35pm	20
Ryan	McGlynn	1:00-1:35pm	20
Kelly	O'Brien	10:15-10:45am	18
Sam	Seidenberg	11:15-11:35am	19
Andriy	Villhauer	1:00-1:35pm	20
David	Wolf	2:05-2:30pm	21

ISAT Majors – Presentations by Room Location and Time

TRACK 1 ~ ISAT – ROOM 136

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
9:00 – 9:40 a.m.	-David Jacob -Matthias Miller -Randall Swartz	Dr. David Lawrence	30-10T
Project Title: <i>Increasing Photo-electrolytic Hydrogen Production Through the Use of Nano-structured Semiconductor Films</i>			
9:45 – 10:10 a.m.	Caitlin Baird	-Dr. Rory DePaolis -Dr. David Cockley	23-10S
Project Title: <i>Pre-linguistic Hearing and Deaf Infants' Sensitivity to the Phonology of Sign</i>			
3:10 – 3:40 p.m.	-Tanner Cummings -Nathan Walker	Dr. Jeffrey Tang	09-10T
Project Title: <i>Mini Baja Racer and Propane Conversion</i>			
3:50 – 4:15 p.m.	Christopher A. Hawkins	Dr. Jeffrey Tang	11-10S
Project Title: <i>UNPEPP Electric Conversion of a Chevrolet S-10 for the Shenandoah National Park</i>			
4:20 – 4:50 p.m.	-Dane Celnicker -Daniel Morgan	Dr. Jeffrey Tang	10-10T
Project Title: <i>Data Collection and Analysis for an Electric Truck in Shenandoah National Park</i>			

TRACK 2 ~ ISAT – ROOM 148

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
9:00am – 10:00am	-Ben Akiyama -John Danko -David Roy -Daniel Yeh	Dr. Christopher Bachmann	06-10T
Project Title: <i>James Madison University Society of Automotive Engineers Supermilage</i>			

11:00am – 11:25am	Ari Giller-Leinwohl	Dr. Robert Prins	07-10S
Project Title: <i>Life Cycle Environmental Impacts of eBikes Used for Campus Commuting</i>			

11:30 – 12:10pm	-Paul Crisman -Robert Loflin, III -Samuel Sweet	Dr. Robert Prins	08-10T
Project Title: <i>JMU E-Cycle</i>			

12:15 – 12:40pm	Matthew Feltz	Dr. Robert Prins	30-10S
Project Title: <i>Characterization of white pine derived Biochars</i>			

TRACK 3 ~ ISAT – ROOM 150

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
9:00am – 9:25am	Michelle Madey	Dr. Ronald Raab	01-01S
Project Title: <i>The Possible Role of Salt Bridges in the Structure and Function of Human Lacritin Expression in E.coli</i>			
9:30am – 9:55am	Heidi Lindenfelser	Dr. Ronald Raab	02-10S
Project Title: <i>Cloning, Expression, and Purification of The Human Secretory Leukocyte Peptidase Inhibitor</i>			
10:00am – 10:25am	Christina Ruiz	Dr. Ronald Raab	03-10S
Project Title: <i>Caveolin-3 Over-expression and O-GlcNAcation in Cardiac Myocyte Caveolae During Diabetes Mellitus</i>			
10:30am – 10:55am	Krista Croxton	-Dr. Louise Temple -Dr. Stephanie Stockwell	04-10S
Project Title: <i>Water as an Environmental Reservoir for Bordetella Avium</i>			
11:00am – 11:25am	-Colton Shaver -Andrew Theodosakis	Dr. Louise Temple	05-10T
Project Title: <i>Determining Cost-Effective Methods for Salmonella Serotyping on Poultry</i>			
11:30am – 11:55am	Lisa Shinkarow	Dr. Louise Temple	37-10S
Project Title: <i>A Secondary Mutagenesis of Bordetella avium</i>			

TRACK 3 ~ ISAT – ROOM 150

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
1:00 – 1:25 p.m.	Michael Fenkenheuer	Dr. Amanda Biesecker	33-10S
Project Title: <i>The effect of Dengue Virus E protein on Human Articular Chondrocyte Cells</i>			

1:30 – 1:55 p.m.	Andrew Gronan	Dr. Jonathan Miles	34-10S
Project Title: <i>Eastern Shore Regional Wind Analysis</i>			

2:00 – 2:40 p.m.	-Linda Nguyen -John Real	Dr. Tony Chen	28-10T
Project Title: <i>Performance Test of a Domestic solar Hot Water Heating System using Evacuated Tubes in Weyers Cave, VA</i>			

2:45 – 3:10 p.m.	Corinn Pope	Dr. Maria Papadakis	31-10S
Project Title: <i>Development of a Wind Turbine Ordinance Database for Land Use Planners</i>			

3:15 – 3:40 p.m.	Patrick Reiser	Dr. Maria Papadakis	49-10S
Project Title: <i>Energy Audit for the Shenandoah National Park Headquarters Building</i>			

TRACK 4 – ISAT – ROOM 159

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
1:30pm-2:30pm	Casey Flanagan	-Dr. Ken Lewis -Mr. Mark Starnes	27-10S
Project Title: <i>Drum Manufacturing Techniques</i>			

TRACK 5 – ISAT – ROOM 337

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
9:00am- 9:25am	Patrick Seal	Dr. Emil Salib	21-10S
Project Title: <i>Wireless Sensor Networks to aid in the Monitoring of Environmental Issues</i>			

9:30am -10:10am	-Jordan Barker -Cyril Thornton	Dr. Emil Salib	22-10T
Project Title: <i>Wireless Sensor Networks: Autonomous Solutions for Large Scale Research</i>			

10:15am -10:40am	Evan Williams	-Dr. Emil Salib -Dr. Jonathan Miles	38-10S
Project Title: <i>Based Remote Data Acquisition System for a Wind/Solar Hybrid Power Plant</i>			

10:45am-11:25am	-Spencer Sayce -Gregory Steinmeyer -Christopher White	Dr. Emil Salib	36-10T
Project Title: <i>The Development of a Comprehensive Communications Suit for EMS Medic Units in a Mass Trauma Scenario</i>			

TRACK 6 – ISAT – ROOM 348

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
10:00am – 10:25am	Donald Gleason, Jr.	Dr. Thomas Benzing	12-10S
Project Title: <i>Forced Gravitational Water Vortex</i>			
10:30am – 10:55am	-Abbaynesh Bryant	Dr. Thomas Benzing	32-10S
Project Title: <i>Algae for Wastewater Treatment</i>			
11:00pm -11:25am	Michael Trop	Dr. Thomas Benzing	13-10S
Project Title: <i>Analysis of Short Term Temperature Trends and their Relationship to the Shenandoah River Fish Kills</i>			
11:30am -11:55am	Christopher Brill	-Dr. Steven Frysinger -Dr. Thomas Benzing -Dr. Morgan Benton	14-10S
Project Title: <i>Fish Disease and Mortality Information System</i>			
1:00pm -1:25pm	Carl Taylor	Dr. Wayne Teel	16-10S
Project Title: <i>Biochar Field Trials</i>			

TRACK 6 – ISAT – ROOM 348

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
1:30pm -2:10pm	-Geoff Austin -Tim Clark -Brandon Dick -John Marier	-Dr. Wayne Teel -Dr. Robert Prins	15-10T
Project Title: <i>Biochar Production System and Analysis</i>			

2:15pm -2:40pm	Andrew Robert	Dr. Wayne Teel	35-10S
Project Title: <i>Small Biochar Production Systems in Developing Nations</i>			

TRACK 7 ~ ISAT – ROOM 350

TIME	PRESENTER	THESIS ADVISOR	PROJECT No.
9:00am-9:40am	-Steven Florian -Will Shoemaker	Dr. Abdelrahman Rabie	26-10T
Project Title: <i>Material Selection for Sustainable Wind Turbines</i>			

9:45am-10:25am	-Vernita Fisher -William McCoy	Dr. Mohamed Zarrugh	24-10T
Project Title: <i>Effective Implementation of FDA's 21 CFR Part 11 Guidelines on Electronic Tracking in Biopharmaceutical Manufacturing</i>			

10:30am-11:10am	-Aaron Ballew -Lucas Hauschner -Nicholas Moran	Dr. Mohamed Zarrugh	253-10T
Project Title: <i>Development of a Process for Customizing Human Joint Replacements</i>			

TRACK 7 ~ ISAT – ROOM 350

11:15am-11:55am	-Ryan Luckay -Alexander Sonifrank	Dr. Mohamed Zarrugh	29-10T
Project Title: <i>The Development of a Combat Robot based on Battlebots IQ Criteria</i>			

1:00pm-1:40pm	-Arthur Burwell -Darrin Whitley	Dr. Morgan Benton	17-10T
Project Title: <i>Spot-A-Ride</i>			

1:45pm-2:25pm	-David Ramsey -Brian Rapp	Dr. Morgan Benton	20-10T
Project Title: <i>Development of a Residential Site Assessment and Economic Feasibility Calculator for Behind-the-Meter Wind Energy Generation in Virginia</i>			

2:30pm-2:55pm	Rachel Palmquist	Dr. Morgan Benton	19-10S
Project Title: <i>OnTrack – An Online Academic Planning Tool for ISAT Majors</i>			

3:00pm-3:25pm	Thomas Haney	Dr. Morgan Benton	18-10S
Project Title: <i>UMatter2Us: The Use of Computers in Peer Assessment for Higher Education</i>			

Information Analysis (IA) Majors

ISAT - ROOM 136 - Instructor – Dr. Jeffrey Tang

TIME	PRESENTER	PROJECT No.
10:15am -10:45am	- Rebecca Brown - Leigh Ferraro - Kelly O'Brien	40-10T
Project Title: Future U.S. Conflicts and the Repercussions for U.S. POWs		

10:50am -11:10am	Jamie Ferron	41-10S
Project Title: The Importance of Sudan's Comprehensive Peace Agreement to Long Term Peace and Stability in Sudan		

11:15am -11:35am	Sam Seidenberg	42-10S
Project Title: The Drug War: What is it Good For?		

11:40am -12Noon	Justin Godby	43-10S
Project Title: Political Relationships between the U.S., China, and North Korea: Realities, Perceptions, and Possibilities		

1:00pm -1:35pm	- Rob Marsh -Ryan McGlynn -Andriy Villhauer	44-10T
Project Title: A Multi-Dynamic Future Assessment of Russia and the Post-Soviet States		

Information Analysis (IA) Majors

ISAT - ROOM 136 - Instructor – Dr. Jeffrey Tang

TIME	PRESENTER	PROJECT No.
1:40pm -2:00pm	Bree Edwards	45-10S
Project Title: The Role of Corporate America in Social Entrepreneurship		
2:05pm -2:30pm	-Kyle Kubin - David Wolf	46-10T
Project Title: Survey and Analysis Regarding Generalists vs. Specialists: The Skill Sets Required to Train the Most Effective and Desirable Junior Analysts		
2:35pm -3:00pm	-Ahmed Ali - Matt Gibson	47-10T
Project Title: The Efficacy of Terrorism: An Assessment of the Tactical and Strategic Success of Al-Qaeda		

TRACK 1 - ISAT- ROOM 136

Time: 9:00-9:40am	Presenters: -David Jacob -Matthias Miller -Randall Swartz	Thesis Advisor: Dr. David Lawrence	Project Number 30-10T
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Project Title: *Increasing Photo-electrolytic Hydrogen Production Through the Use of Nano-structured Semiconductor Films*

Abstract:

The purpose of this project was to develop photosensitive nanostructured semiconductor oxide films that would generate a sufficient photocurrent to electrolyze water. The semiconductors utilized were made of titanium dioxide and tungsten trioxide, and were prepared by the anodization of titanium and tungsten to create photosensitive oxides. Nanostructures, including nanotubes, nanopores and nanoplatelets, were verified by imaging on a scanning electron microscope. Additionally, the photocurrent produced by our electrode films was recorded by directing a UV lamp onto them and monitoring the current produced while periodically blocking the light beam. When unblocked, a small but measureable current was observed. When blocked, the current dropped to zero verifying that our electrodes are photosensitive. This technology has the potential to lead to carbon-free hydrogen production, which could reduce dependence on fossil fuels. Preliminary results are promising in that hydrogen gas generation was observed, but the exact quantity has yet to be determined.



ISAT- ROOM 136

Time: 9:45am – 10:10am	Presenter: Caitlin Baird	Thesis Advisors: -Dr. Rory DePaolis -Dr. David Cockley	Project Number 23-10S
Project Title: <i>Pre-linguistic Hearing and Deaf Infants' Sensitivity to the Phonology of Sign</i>			
External Sponsors: <i>JMU – Department of Communication Sciences and Disorders</i>			
Abstract: The purpose of this study was to determine if pre-linguistic hearing infants show a level of sensitivity to the difference between familiar and unfamiliar signed words. Previous research has shown that deaf infants begin to demonstrate early imitation of signed words around 8.5 months. Similarly, it is known that hearing infants begin to recognize auditory word forms by 11 months of age. This study addresses infant looking time to American Sign Language (ASL) for both hearing and deaf infants by adapting the auditory head-turn paradigm for the visual modality. This paradigm uses infant looking time to visual stimuli, either signed words thought to be familiar or unfamiliar, to investigate infants' sensitivity to the phonology of sign. The data provide baseline data for establishing differences between hearing and deaf infants' sensitivity to the phonology of sign.			
			

ISAT- ROOM 136

Time: 10:15am -10:45am	Presenters: -Rebecca Brown -Leigh Ferraro -Kelly O'Brien	Instructor: Dr. Jeffrey Tang	Project Number 40-10T
Project Title: <i>Future U.S. Conflicts and the Repercussions for U.S. POWs</i>			
Abstract: <p>The purpose of this project is to examine future conflicts that the U.S. could become involved in and the POW situations that will result from these conflicts. How POWs are caught, treated and what types of situations they are being kept in, will facilitate the development of various scenarios that will lead to their safe return. Analytic Methodologies were utilized in developing the Regional Case Studies and creating strategies for retrieving U.S. POWs, which include Hypothesis Testing, Counterfactual Reasoning, and Strategy Assessment. Initial research indicated there is the potential to improve the accounting system for POWs, which will be an issue discussed in the presentation.</p>			

Time: 10:50am -11:10am	Presenter: Jamie Ferron	Instructor: Dr. Jeffrey Tang	Project Number: 41-10S
Project Title: <i>The Importance of Sudan's Comprehensive Peace Agreement to Long Term Peace and Stability in Sudan</i>			
Abstract: <p>In 2005 Sudan ended one of the longest civil wars in African history, which spanned for a little over two decades. The war ended when the two opposing forces the Government of Sudan, located in the north, and the Sudanese Peoples Liberation Movement, located in the south, signed the Comprehensive Peace Agreement (CPA). The CPA established a new unified government between the north and the south, and also gave the south semi-autonomous rule over their own lands. This document also established goals for both sides to work together to meet in order to ensure the country would follow a fair democratic system where all sides had fair representation in the national government. All of these goals established in the CPA were given deadlines that were to be met before the south voted to for their own independence in 2011 as guaranteed by the CPA. The smooth progress and eventual completion of the CPA before 2011 is of the utmost importance for Sudan if the country is to establish long lasting peace and stability. Utilizing a variety of analytical tools this project analyzes the current progress of the CPA, how well it is working so far and projects whether or not the CPA will be completed by the 2011 referendum and what will happen if it is not completed by that date. This project speculates on possible scenarios that were developed using strict analytic methods, on what may happen if the south does in fact secede from Sudan all together and becomes their own independent state, and assesses the global and regional implications and more importantly potential implications for the United States.</p>			

ISAT- ROOM 136

Time: 11:15am -11:35am	Presenter: Sam Seidenberg	Instructor: Dr. Jeffrey Tang	Project Number 42-10T
Project Title: <i>The Drug War: What is it Good For?</i>			
Abstract: This project will focus on the failure of the American War on Drugs, and describe a better way to deal with the issue of drugs in our society. The issue will be examined using skills and concepts learned throughout the Information Analysis major. These include othering, cognitive psychology, system dynamics, ethics, and more.			

Time: 11:40am -12noon	Presenter: Justin Godby	Instructor: Dr. Jeffrey Tang	Project Number 43-10S
Project Title: <i>Political Relationships between the U.S., China, and North Korea: Realities, Perceptions, and Possibilities</i>			
Abstract: If perspective defines reality, then the intertwined political relationships of the United States, China, and North Korea pose a significant challenge for U.S. policy-makers. All three countries have wide-reaching and dramatically diverse political goals viewed through different lenses. This project will define the complex relationship between countries A and B including recent political tensions, how country C may perceives this relationship, and how country C may proceed on the international stage with respect to their own self-interests. Possible courses of action will be presented based on the implications of the perceived relationship between A and B. Opportunities and challenges for the U.S. as well as future outlooks for the East and Northeast Asian regions will also be considered.			

ISAT- ROOM 136

Time: 1:00pm -1:35pm	Presenters: -Rob Marsh -Ryan McGlynn -Andriy Villhauer	Instructor: Dr. Jeffrey Tang	Project Number 44-10T
Project Title: <i>A Multi-Dynamic Future Assessment of Russia and the Post-Soviet States</i>			
Abstract: After the fall of the Soviet Union in 1991, many of the newly independent states faced the decision of whether to orient their future with the West or with Russia. This project will highlight the countries that have "escaped" Russia's grasp and those that are still closely aligned with Moscow. In recent years, several states have tried to "turn west" and join several western alliances like NATO and the EU causing friction and even violence with Russia. In this presentation, we will analyze possible conflicts that may arise in this region as Russia and the West continue to battle for influence in Eurasia.			

Time: 1:40pm -2:00pm	Presenter: Bree Edwards	Instructor: Dr. Jeffrey Tang	Project Number 45-10S
Project Title: <i>The Role of Corporate America in Social Entrepreneurship</i>			
Abstract: Despite the numerous advancements in human welfare afforded by capitalism and globalization, sustainability problems continue to plague low-income communities worldwide. American corporations are increasingly recognizing the potential success of applying business perspectives to sustainable development initiatives, both in the world's Bottom of the Pyramid and domestically. Some have asserted that private sector participation in social entrepreneurship could provide the innovative approaches necessary to enhance global social value while promoting the competitive edge of the private sector companies involved. No matter what the motive is for involvement, it is essential that an American firm assess the socially entrepreneurial positions of other U.S. private sector companies before committing to social enterprise. This will enable it to determine if adapting social entrepreneurship into its business agenda would be competitively advantageous. This report will reveal the role of corporate America in social entrepreneurship via illustrating the assessment necessary of a US firm when considering how to best enhance its social responsibility.			

ISAT- ROOM 136

Time: 2:05pm -2:30pm	Presenters: -Kyle Kubin -David Wolf	Instructor: Dr. Jeffrey Tang	Project Number 46-10T
Project Title: <i>Survey and Analysis Regarding Generalists vs. Specialists: The Skill Sets Required to Train the Most Effective and Desirable Junior Analysts</i>			
Abstract: <p>Our main objective for this paper is to find out if/how the skills we have learned through our three years in the IA major will translate into, not only getting a job coming out of college as an analyst, but also how to be the most effective and ready to contribute to tasks required in the workforce. We are seeking to bridge the academic side of the major into the real working world and in order to do so, we will look to the curriculum of the IA major as well as to interviews conducted with members of the intelligence community who are either analysts or who deal with analysts professionally.</p>			

Time: 2:35pm -3:00pm	Presenters: -Ahmed Ali -Matt Gibson	Instructor: Dr. Jeffrey Tang	Project Number 47-10T
Project Title: <i>The Efficacy of Terrorism: An Assessment of the Tactical and Strategic Success of Al-Qaeda</i>			
Abstract: <p>The terrorist group, Al-Qaeda, was formed in the aftermath of the Afghan War; the title of founder is accredited to Osama Bin Laden, who was a member of the mujahedeen (the Muslim resistance movement fighting against Soviet occupation of Afghanistan). Bin Laden officially declared war on the United States by issuing a fatwa in 1996 due to the injustice he felt from US presence in Saudi Arabia. Al-Qaeda is thought to be responsible for many significant terrorist attacks targeting the US, and possibly the most important, the 9/11 attack on the World Trade Center. Thus, began what we know today as The War on Terror. The purpose of this paper is to identify, with a clear definition, what terrorism is and whether or not terrorism is an effective tool or means to achieve a goal. We will look at Al-Qaeda specifically by analyzing their goals and determining their efficacy by comparing their success to their methods of operation over the past decade and how the US has reacted in response to them. We will also discuss the difference between tactical and strategic terrorism, and how that difference can influence the efficacy of a terrorist group.</p>			

ISAT- ROOM 136

Time: 3:10pm –3:40pm	Presenters: -Tanner Cummings -Nathan Walker	Thesis Advisor: Dr. Jeffrey Tang	Project Number 09-10T
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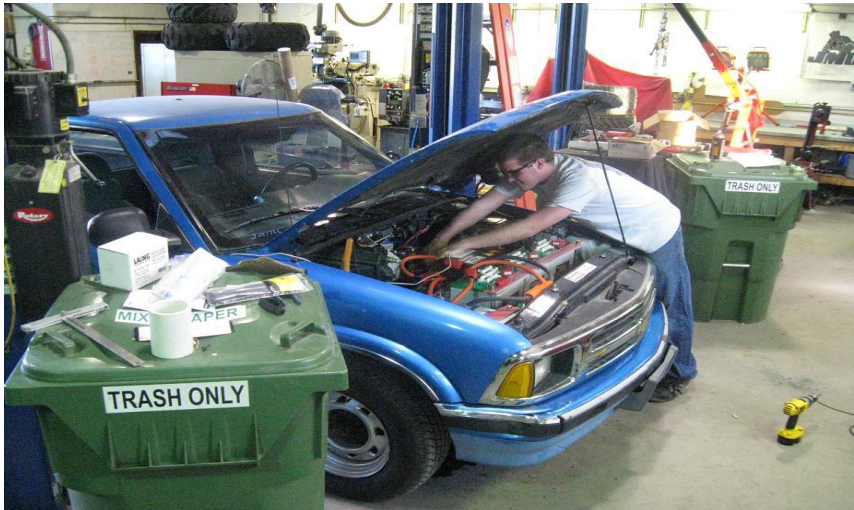
Project Title: *Mini Baja Racer and Propane Conversion*

Abstract:

The Mini Baja Team constructed an off-road vehicle to have it compete in the SAE sponsored Mini-Baja competition. The team raised the funds to build the vehicle and by following the provided rules, a vehicle was built and tested to race. The Mini Baja's engine was converted to run off of propane.



ISAT- ROOM 136

Time: 3:50pm –4:15pm	Presenter: Christopher Hawkins	Thesis Advisor: Dr. Jeffrey Tang	Project Number 06-10S
Project Title: <i>UNPEPP Electric Conversion of a Chevrolet S-10 for the Shenandoah National Park</i>			
<p>Abstract : This project details the full conversion of a Chevrolet S-10, from an internal combustion engine to a fully functional electric vehicle. The truck was provided from Shenandoah National Park and returned to the park upon completion for full-service use. The scope of the project includes pre-conversion information such as parts selection and design implementation, details of the physical conversion, and also post-conversion elements such as road testing and the return of the vehicle to the national park.</p>			
			

Time: 4:20pm – 4:50pm	Presenters: -Dane Celnicker -Daniel Morgan	Thesis Advisor: Dr. Jeffrey Tang	Project Number 10-10T
Project Title: <i>Data Collection and Analysis for an Electric Truck in Shenandoah National Park</i>			
<p>Abstract : While a lot of attention is being given to the development of battery technology for electric vehicles, it is also important to explore user satisfaction and public perception. The purpose of this project is to analyze these less technical aspects of electric vehicles, while also gathering and analyzing performance data for a vehicle in real life situations. The vehicle used in this project is a pickup truck that was converted from an internal combustion vehicle to an electric vehicle, using a grant from the University National Park Energy Partnership Program (UNPEPP). The truck was then delivered to Shenandoah National Park for use by the employees.</p>			

TRACK 2 - ISAT- ROOM 148

Time: 9:00am – 10:00am	Presenters: -Ben Akiyama -John Danko -David Roy -Daniel Yeh	Thesis Advisor: Dr. Christopher Bachmann	Project Number 06-10T
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Project Title: *James Madison University Society of Automotive Engineers Supermilage*

External Sponsors:

Mr. Lee Smith -Little Red Barn
 Mr. Dan Drumheller - Valley Precision,
 Mr. Kevin Shifflett and Mr. Scott Shittlett - Shifflett Machine Shop,
 Mr. Peter Florance - CET/CSM Audio Services
 Mr. Don Long - Big Al's A1 Autos


Abstract:

With rising gas prices, realization of the limit of economically obtainable fossil fuels, and the growing environmental push for a greener society, an alternative to traditional automobile transportation is needed. The United States has a close relationship with the automotive industry yet it is still operating with low efficiencies and high fuel consumption. The goal of this project was to



show that a high-efficiency vehicle can be produced now that will greatly extend the time remaining before the final exhaustion of conventional oil. By altering the ideology that large, traditional automobiles are what people need we can help people recognize that energy efficiency is a viable part of the solution. Our goal is to achieve a fuel economy of approximately 1000 miles/gallon. Initially started as part of the Society of Automotive Engineer's SuperMileage competition, this vehicle utilizes a 3.5 horsepower Briggs and Stratton motor similar to that found in lawn mowers. By changing the operating parameters of the engine, the aerodynamics of the vehicle, and the materials used in traditional automobiles, enormous gains in fuel efficiency can be achieved.

ISAT- ROOM 148

Time: 11:00am – 11:25am	Presenter: Ari Giller-Leinwohl	Thesis Advisor: Dr. Robert Prins	Project Number 07-10S
Project Title: <i>Life Cycle Environmental Impacts of eBikes Used for Campus Commuting</i>			
External Sponsor: Dr. Cynthia Nolt-Helms - EPA National Center for Environmental Research and Development			
Abstract: Ebikes offer an innovative form of mobility that is gaining popularity in crowded cities, especially for shorter range commuting. Ebikes are traditional bicycles that can travel faster, over longer ranges, steeper pitches, all with less rider effort. Electricity drawn from batteries allows an electromagnetic motor to assist in propelling the bike forward. The batteries are recharged using electricity, usually from the power grid. The energy and material flows associated with eBike use were analyzed and quantified. Power requirements of the eBike under varying conditions were formulated and optimized for the JMU 'Duty Cycle' eBike. Real time riding data was measured for actual JMU commutes using the Cycle Analyst power meter, computer interfaced data logging, and GPS. Embedded energy impacts of eBike material such as frames and batteries were also explored.			

ISAT- ROOM 148

Time: 11:30am – 12:10pm	Presenters: -Paul Crisman -Robert Loflin, III -Samuel Sweet	Thesis Advisor: Dr. Robert Prins	Project Number 08-10T
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Project Title: *JMU E-Cycle*

External Sponsors: Blue Grass Book Bank, Battery Mart


Abstract:

In an effort to create a working alternative fuel vehicle, the presenting group has designed and constructed, along with the effort of other facilitating parties, an electrically-powered motorcycle. The project involves a complete understanding of the performance characteristics of electric motors and electric vehicles, as well as hands-on fabrication and design of the working model. The project extends further to capture societal issues involving fossil fuels and subsequent modes of transportation. Furthermore, the project is directed to achieve a

land speed record in order to show that alternative fuel vehicles can compete with, or even outperform, current fossil fuel driven vehicles.




ISAT- ROOM 148

Time: 12:15pm – 12:40pm	Presenter: Matthew Feltz	Thesis Advisor: Dr. Robert Prins	Project Number 30-10S
Project Title: <i>Characterization of white pine derived Biochars</i>			
<p>Abstract: Failing soils and rising CO2 levels are two major problems facing much of the world today. Biochar, a material formed by heating an organic material to a very high temperature in the absence of oxygen, is a potential solution to both of these issues. Many different characteristics affect the way in which a sample of biochar performs in the soil including pH, ash content, and porosity. My hypothesis was that biochar created at different charring times and temperatures would have significantly different characteristics, namely different porosities. To test this hypothesis I charred samples of pine in a benchtop furnace, and then examined their pore surfaces under an SEM (Scanning Electron Microscope). I found that those chars created at higher times and temperatures tended to have smaller pore sizes that those created at lower times and temperatures.</p>			
			

TRACK 3 - ISAT- ROOM 150

Time: 9:00am – 9:25am	Presenter: Michelle Madey	Thesis Advisor: Dr. Ronald Raab	Project Number: 01-01S
Project Title: <i>The Possible Role of Salt Bridges in the Structure and Function of Human Lacritin Expression in E.coli</i>			
Abstract : Lacritin is a novel human tear protein that has been able to stimulate new tear production. This means that lacritin has the possibility to be used as a human therapeutic to treat dry eye syndrome, which affects millions of people. When lacritin is expressed in <i>E.Coli</i> protein yields are on average between 100ug/mL and 120ug/mL, this is considered low yields. In this study, site directed mutagenesis, has been used to make point mutations in the lacritin gene at the three proposed salt bridges. Changing these salt bridge amino acids to neutral serine has increased the amount of lacritin purified from <i>E. coli</i> . One of these salt bridge mutations K66S/E70S has been found to have up to 4 times the lacritin protein yields while still having antimicrobial activity as compared to lacritin.			
			

ISAT- ROOM 150

Time: 9:30am – 9:55am	Presenter: Heidi Lindenfelser	Thesis Advisor: Dr. Ronald Raab	Project Number: 02-10S
Project Title: <i>Cloning, Expression, and Purification of The Human Secretory Leukocyte Peptidase Inhibitor</i>			
Abstract: The Human Secretory Leukocyte Peptidase Inhibitor (SLPI) is a protein secreted in various parts of the body, including the lacrimal gland. SLPI inhibits the breakdown of epithelial tissue. Other research has found SLPI to be overexpressed in ovarian cancer cells as determined when anti-SLPI antibodies were used. A protein analysis program was used to determine SLPI's properties so it could be compared to lacritin, a key biomolecule in Dry Eye Syndrome research. It was determined that SLPI does have some characteristics similar to lacritin. Primers were designed so that PCR could be performed to clone the SPLI gene from a cDNA plasmid. An expression vector and restriction enzymes were chosen to insert the SLPI gene into. The recombinant plasmid was transformed into E. coli for expression. SLPI was expressed, purified and analyzed. Unfortunately, SLPI was found to have little antimicrobial properties when compared to lacritin. Continued research of SLPI is important, as is may help us understand its role in cancer as well as its role in the lacrimal gland.			
			

ISAT- ROOM 150

Time: 10:00am – 10:25am	Presenter: Christina Ruiz	Thesis Advisor: Dr. Ronald Raab	Project Number: 03-10S
Project Title: <i>Caveolin-3 Over-expression and O-GlcNAcation in Cardiac Myocyte Caveolae During Diabetes Mellitus</i>			
External Sponsor: External Sponsor: UCSD MSTP, Dr. Hemal Patel and Dr. David Roth of the VA Healthcare System, San Diego, CA			
Abstract : Diabetes mellitus (DM) is often associated with cardiac dysfunction independent of hypertension or coronary artery disease, suggesting hyperglycemia may directly affect cardiac myocytes. DM increases beta O-linkage of N-acetylglucosamine (O-GlcNAc) to proteins, a post-translation modification that causes functional changes. Caveolin-3 (Cav-3), a structural protein in cardiac myocytes, regulates receptors and signaling molecules in caveolae to coordinate changes in cell function. We hypothesize that: 1) diabetes results in loss of caveolae leading to cardiac dysfunction and 2) cardiac specific over-expression of Cav-3 (Cav-3 OE) protects against such dysfunction. Wild type and Cav-3 OE mice were subjected to a Type 2 DM model. Wild-type diabetic hearts have decreased Cav-3 expression and increased O-GlcNAcation of proteins in caveolar fractions prepared by sucrose density gradients, an effect not observed in Cav-3 OE DM hearts. Overexpression of Cav-3 in the heart may attenuate the cardiac dysfunction associated with DM possibly by protecting O-GlcNAcation of proteins.			
			

ISAT- ROOM 150

Time: 10:30am – 10:55am	Presenter: Krista Croxton	Thesis Advisors: -Dr. Louise Temple -Dr. Stephanie Stockwell	Project Number: 04-10S
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Project Title: *Water as an Environmental Reservoir for Bordetella Avium*

Abstract :

Bordetella avium is a bacterial organism which causes a communicable respiratory disease in turkeys that negatively impacts the poultry industry. *B.avium* is known to be highly transmissible, and it is possible that it may spread through contaminated litter or water. However, an environmental reservoir has never been identified. *B. avium* has been shown to survive for weeks in low salt content water. In attempt to isolate *B. avium* from the environment, water samples from differing locations coinciding with poultry farms were taken, and a number of samples were concentrated by filtration and cultured on artificial medium that limits growth of other common water bacteria. Several candidate organisms were isolated, phenotypic tests were performed, and polymerase chain reaction was performed using *B. avium* specific primers. DNA products are being sequenced in order to determine the genus and species of the isolated bacteria.



ISAT- ROOM 150

Time: 11:00am – 11:25am	Presenters: -Colton Shaver -Andrew Theodosakis	Thesis Advisor: Dr. Louise Temple	Project Number: 05-10T
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Project Title: *Determining Cost-Effective Methods for Salmonella Serotyping on Poultry*

Abstract:

Every year, poultry processing plants are closed due to large numbers of birds being contaminated with strains of Salmonella that are dangerous to humans. Plants are required by the USDA to characterize such contaminants as fully as possible. Due to this need, various potential Salmonella serotyping methods were evaluated to assess whether JMU could aid the Virginia Poultry Growers Association. Nineteen unspciated isolates were obtained from a local plant and tested by two methods. The Biotek Selecta ELISA kit works by testing for specific proteins in the Salmonella isolates. The isolates tested were each narrowed down to two or three strains in two different trials. Multiplex PCR amplifies regions of the chromosome specific to certain strains; trials of this method are ongoing at present. If these tests prove effective at a low price, they could represent a more efficient way for poultry processing plants to adhere to Salmonella characterization regulations.



ISAT- ROOM 150

Time: 11:30am – 11:55am	Presenter: Lisa Shinkarow	Thesis Advisor: Dr. Louise Temple	Project Number 37-10S
Project Title: <i>A Secondary Mutagenesis of Bordetella avium</i>			
Abstract <p><i>Bordetella avium</i> is the causative agent of a respiratory infection in turkeys that causes financial losses to the poultry industry every year. Previous investigations into the factors that help the bacterium attach to the tracheal cilia showed two essential proteins. With those genes deleted, strains (pseudorevertants) obtained from infected turkeys were still able to attach to cilia and these strains could agglutinate red blood cells, an activity that mimics cilia attachment. In this study, these pseudorevertant strains were mutagenized using transposons, and strains once again unable to hemagglutinate were identified. Sequencing of the genes interrupted by the transposon revealed two genes predicted to encode membrane proteins. However, these genes encode proteins that are not obvious candidates for attachment factors, but instead are involved in transport of nutrients across the membrane. Further study will be required to understand the relationship between these proteins and the attachment process.</p>			



ISAT- ROOM 150

Time: 1:00pm – 1:25pm	Presenter: Michael Fedkenheuer	Thesis Advisor: Dr. Amanda Biesecker	Project Number 33-10S
Project Title: <i>The effect of Dengue Virus E protein on Human Articular Chondrocyte Cells</i>			
Abstract <p>Dengue Virus (DENV) is a mosquito borne virus that is endemic to many regions in Asia, the Pacific, the Americas, and the Caribbean. The CDC estimates that dengue infects 50-100 million people a year resulting in about 500,000 cases of the severe form of Dengue Fever (DF), Dengue Hemorrhagic Fever (DHF). DENV causes thousands of deaths a year and causes severe economic distress in many underdeveloped countries. The only surface antigen, the envelope protein, is highly immunogenic and is the target protein in many vaccine studies. In this study, E protein has been cloned into a mammalian expression vector for studies in human articular chondrocyte cells. No work has currently been done to determine if DENV can directly infect chondrocytes or indirectly influence these cells through signals passed by monocytes through the extracellular matrix. This study is an attempt to answer these two questions. Currently, the project has been revamped to circumvent issues of insolubility of the full length E protein product. Soluble E is in the final stages of being cloned and purified via bacterial and mammalian cells in accordance with current literature.</p>			

ISAT- ROOM 150

Time: 1:30pm – 1:55pm	Presenter: Andrew Gronan	Thesis Advisor: Dr. Jonathan Miles	Project Number: 34-10S
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Project Title: *Eastern Shore Regional Wind Analysis*

Abstract:

The purpose of this project is to assess the regional wind resource of the eastern shore of Virginia and the Chesapeake Bay. As the need for renewable and clean energy continues to grow, we must work to obtain reliable and sustainable sources such as wind energy. The wind resource in Virginia lies primarily in the coastal areas and thus it is vital that we have a clear understanding of its potential. This assessment uses existing data at seven sites along the coast and data currently being acquired at Tangier Island. The results will also be compared to the American Wind Energy Association’s wind resource map projections to determine the validity of the estimates.



ISAT- ROOM 150

Time: 2:00pm – 2:40pm	Presenters: -Linda Nguyen -John Real	Thesis Advisor: Dr. Tony Chen	Project Number 28-10T
Project Title: <i>Performance Test of a Domestic Solar Hot Water System using Evacuated Tubes in Weyers Cave, VA</i>			
External Sponsors: Dr. Ken Overway, Bridgewater College, Mr. Jeff Kirschbaum, Solar Panels Plus, LLC			
Abstract: <p>Our project focuses on analyzing a residential solar hot water heating system in the Weyers Cave area of Rockingham County, VA. The system consists of two racks total 8.32 m² Solar Panels Plus SPP-30™ evacuated tubes and a 120-gallon Rheem® single heat exchange storage tank connected to an existing propane-fired hot water heater that provides both hot water and space heating to the house. Data collection on temperatures and solar energy inputs to the system allows us to calculate the month-by-month and annual solar fraction of energy provided to the system as well as the overall efficiency of the system. Based upon heat loss, energy supplied, and current fuel cost values, a simple payback period for the system was also estimated.</p>			
			

ISAT- ROOM 150

Time: 2:45pm – 3:10pm	Presenter: Corinn Pope	Thesis Advisor: Dr. Maria Papadakis	Project Number: 31-10S
Project Title: <i>Development of a Wind Turbine Ordinance Database for Land Use Planners</i>			
Abstract: This project will provide land use planners with an easy to use tool to help develop wind energy specific ordinances. The tool will include a database housed by JMU of wind ordinances from across the United States and will be searchable on a website. It will promote the development of wind ordinances throughout the country and therefore increase the ease of implementing a wind energy system.			

Time: 3:15 – 3:40pm	Presenter: Patrick Reiser	Thesis Advisor: Dr. Maria Papadakis	Project Number: 49-10S
Project Title: <i>Energy Audit for the Shenandoah National Park Headquarters Building</i>			
Abstract: Energy consumption and efficiency have become hot topics recently due to the increased importance placed on energy use. This project presents the investigation and analysis of energy consumption at a specific location, the Shenandoah National Park Headquarters Building. By investigating the lighting systems, heating, ventilating and air conditioning systems as well as the building envelope, improvements were identified that will allow for decreased energy consumption and financial savings. The principles behind this energy audit can be applied to most residential and office buildings in order to identify possible areas of improvement and savings.			

TRACK 4 - ISAT- ROOM 159

Time: 1:30pm-2:30pm	Presenter: Casey Flanagan	Thesis Advisors: -Dr. Kenneth Lewis -Mr. Mark Starnes	Project Number: 27-10S
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Project Title: *Drum Manufacturing Techniques*

Abstract:

This project focuses on designing and building a technically and aesthetically superior set of drums. The project's focus on manufacturing techniques shows the value of time management, foresight, and process efficiency. The presentation will include an in-depth view of how each part of the drums was made and a musical performance.



TRACK 5 - ISAT- ROOM 337

Time: 9:00am- 9:25am	Presenter: Patrick Seal	Thesis Advisor: Dr. Emil Salib	Project Number: 21-10S
Project Title: <i>Wireless Sensor Networks to aid in the Monitoring of Environmental Issues</i>			
Abstract: <p>Monitoring of the environment by use of wireless sensors is a technology that can be used to quickly solve problems and obtain vast quantities of information in a short amount of time. This project implements Wireless Sensor Networks (WSNs) to be used for data acquisition in pilot trials. Using the constructed WSNs data was to be collected and sent back to certain base stations placed near the testing sites. Analysis and comparison to other Shenandoah fish kill data trials was completed once data had been taken multiple times across different locations located around the river. These trials focused specifically on the local issue of the Shenandoah River fish kill and aimed to gather data that could be used to aid in restoration efforts or for simple data collection purposes.</p>			
			

ISAT- ROOM 337

Time: 9:30am -10:10am	Presenters: -Jordan Barker -Cyril Thornton	Thesis Advisor: Dr. Emil Salib	Project Number: 22-10T
Project Title: <i>Wireless Sensor Networks: Autonomous Solutions for Large Scale Research</i>			
Abstract: <p>The use of wireless sensor networks has increased dramatically over the past decade. The flexibility and autonomous nature of wireless sensor networks allow users to collect data of any type and remotely access this data virtually anywhere in the world. The purpose of this project was to create a system for harvesting environmental data and delivering the results in real-time. The system incorporates Crossbow's Imote2, .net edition wireless sensor network, remote database processing, hermetically sealed enclosures and solar photovoltaic cells that together, create a data collecting system that is completely autonomous and can endure even the harshest conditions. The remainder of this report covers the hardware components used, software programming, and detailed description of the steps taken and the final results of the project.</p>			

Time: 10:15am -10:40am	Presenter: Evan Williams	Thesis Advisors: -Dr. Emil Salib -Dr. Jonathan Miles	Project Number 38-10S
Project Title: <i>Based Remote Data Acquisition System for a Wind/Solar Hybrid Power Plant</i>			
Abstract: <p>The purpose of this project is to create a data acquisition (DAQ) system for a wind/solar hybrid power plant. The objective is to make the DAQ system reliable, cost effective, and easily accessible and upgradeable via wireless connections to a central location/site. The DAQ system will be designed and implemented to provide web-based, real-time and remotely accessible weather, and power generation and consumption data. In addition, the DAQ system will store the data and make it remotely available for analysis by students or researchers. The system will be built with the capability for two way communications between the power plant and a central site, thus providing the necessary infrastructure for adding control and remote management at a future date.</p>			

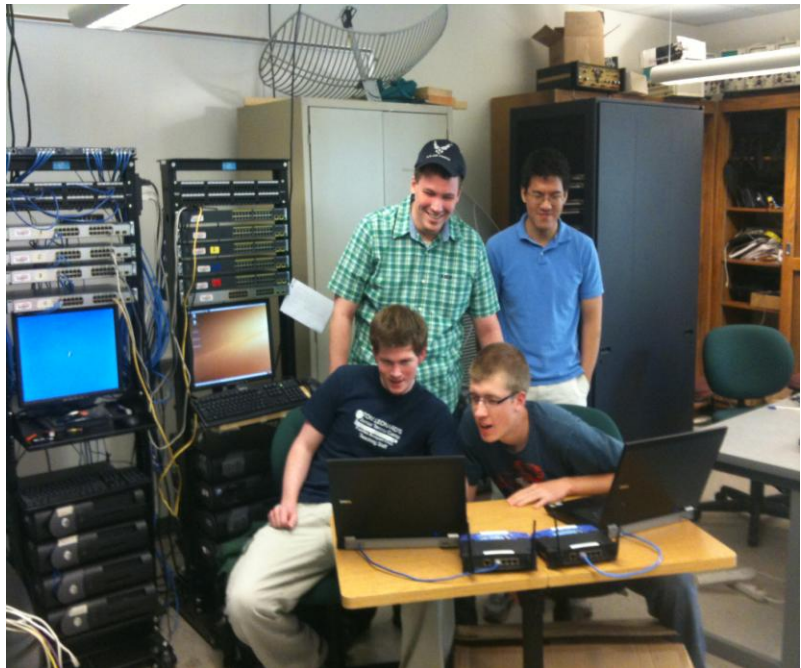
ISAT- ROOM 337

Time: 10:45am-11:25am	Presenters: -Spencer Sayce -Gregory Steinmeyer -Christopher White	Thesis Advisor: Dr. Emil Salib	Project Number: 36-10T
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Project Title: *The Development of a Comprehensive Communications Suit for EMS Medic Units in a Mass Trauma Scenario*

Abstract:

The purpose of this project is to develop a communications suite for EMTs transporting patients from the scene of a mass trauma incident to the hospital. Ideally, the system will take patient vitals from a PhysioControl LifePak 15 (or similar unit) through a USB port, combine those vitals with video from a webcam and audio from an external microphone, and transmit all of the data over WiMax, SatCom, or 3G to the hospital where it will be displayed for the ER doctors and nurses to see. Due to complications with vendors and lack of funding, the project has had to simulate most of these processes through custom computer programs although the proof of concept system proves that this could be a viable system. The methodology and results for this project are detailed below.



TRACK 6 - ISAT- ROOM 348

Time: 10:00am – 10:25am	Presenter: Donald Gleason, Jr.	Thesis Advisor: Dr. Thomas Benzing	Project Number: 12-10S
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Project Title: *Forced Gravitational Water Vortex*

Abstract:

This project explores the technology of the forced gravitational water vortex and works to validate claims by Austrian engineer Franz Zotlöterer, who invented it. The goal of the water vortex is to provide green energy at a constant rate while, at the same time, safely aerating the water. It is an open system with a large surface area of moving water and a slow-moving turbine that makes the vortex safe for fish. The vortex does not require pressure differentials to move its turbine, and rivers do not to be dammed. This technology is of ideal interest to entities that would benefit from a clean, safe, and healthy environment.



ISAT- ROOM 348

Time: 10:30am – 10:55am	Presenter: -Abbaynesh Bryant	Thesis Advisor: Dr. Thomas Benzing	Project Number: 32-10S
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Project Title: *Algae for Wastewater Treatment*

Abstract:

This project consists of working with two strains of green algae, *Ankistrodesmus* and *Chlorella*. This experiment hopes to illustrate the importance of using alternative methods to clean our wastewater, while using the full grown algae in other applications. Algae have the ability to grow incredibly fast and they are a resource for numerous things; such as most Earth's oxygen, additionally their extracts can be found in numerous foods, pharmacy, industrial, cosmetic and other applications. These two algae strains were grown in wastewater retrieved from the Freedom House located in Harrisonburg VA. Every day, water was collected in a 5 ml tube to be analyzed by performing ion chromatography which is able to measure concentrations of major anions such as nitrate and phosphate. Once a week, chlorophyll A test was conducted to measure the growth rate of each strain of algae.



ISAT- ROOM 348

Time: 11:00pm -11:25am	Presenter: Michael Trop	Thesis Advisor: Dr. Thomas Benzing	Project Number: 13-10S
Project Title: <i>Analysis of Short Term Temperature Trends and their Relationship to the Shenandoah River Fish Kills</i>			
<p>Abstract: Beginning in 2004, the Shenandoah River experienced a number of fish kills that raised concern in the community and has lead to research into the quality of the water as a possible cause. This study analyzed water temperature at several locations to determine the trends that were occurring. The second objective was to determine whether or not the slope of the gap in the Broadway data was similar to the slopes of the other water Treatment Plants. In order to determine the slopes of three, five, and ten year intervals for the data, the process of decomposition was used in Minitab. For the Broadway gap analysis, simple trend analysis was utilized. From this experiment, it was determined that the change in temperature for the Shenandoah River for each location increases and decreases by different intervals. The slope of the gap in the Broadway data was determined to be about 2.7 times less than the slope of Woodstock and 1.4 times less than the slope of Strasburg over that same time period. It is recommended that this project be followed up to determine why the temperature changes are different in some years than in others.</p>			
			

ISAT- ROOM 348

Time: 11:30am -11:55am	Presenter: Christopher Brill	Thesis Advisors: -Dr. Steven Frysinger -Dr. Thomas Benzing -Dr. Morgan Benton	Project Number: 14-10S
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Project Title: *Fish Disease and Mortality Information System*

Abstract:

In various parts of Virginia, commonly in agricultural regions, a problem has arisen significantly related to various watersheds. This problem is known as fish disease and mortality, otherwise known as fish kill under certain circumstances, which is identified as being not only a loss of aquatic organisms but also an important indicator of the condition of the ecosystem. This thesis project is intended to supplement solutions to the problem by optimizing information flow through designing an environmental information system. The methodology of creating the system included analyzing the needs and requirements, designing and implementing the system, testing the system, and refining the system. After thorough discussion with the clients representing local environmental departments, it was decided that creating a web based application is most appropriate.



ISAT- ROOM 348

Time: 1:00pm -1:25pm	Presenter: Carl Taylor	Thesis Advisor: Dr. Wayne Teel	Project Number 16-10S
Project Title: <i>Biochar Field Trials</i>			
External Sponsor: Mr. Erich Knight, Shenandoah Gardens			
Abstract: <p>Current agricultural practices are doomed to collapse. This is a project investigating a rediscovered agricultural practice of using Biochar, pyrolyzed organic matter (charcoal), added to the soil to increase plant productivity. Biochar, when mixed into soil, increases the soil fertility, helps retain and regulate moisture, as well as aerate the soil. Additionally, the char is a perfect medium for bacteria which are vital for plant growth. It also has a large surface area because of its porosity which helps it absorb and hold nutrients. For this project we grew corn with two types of Biochar mixed into the soil at two different amounts. The soil also had various other additives mixed in: compost, fertilizer, and Mycorrhizae (symbiotic fungi). The corn was harvested and statistics run on the yield to see which Biochar combination worked best compared to the controls; analysis showed that Biochar additions are better than controls, with the exception of the compost control.</p>			
			

ISAT- ROOM 348

Time: 1:30pm -2:10pm	Presenters: -Geoff Austin -Tim Clark -Brandon Dick -John Marier	Thesis Advisor: -Dr. Wayne Teel -Dr. Robert Prins	Project Number: 15-10T
Project Title: <i>Biochar Production System and Analysis</i>			
Abstract: The development and construction of an initial prototype model of the biochar reactor designed for farm scale use. Biochar is the material remaining after biomass is heated in a controlled environment without oxygen, a process known as pyrolysis. Biochar acts as a soil amendment, increasing both water and nutrient holding capacity, balances soil PH, and is a method of carbon sequestration and storage. Excess heat will be collected via a heat exchanger and transferred into a neighboring hydroponic greenhouse. An analysis of data such as temperature variables and different feedstocks provide us with an opportunity to better visualize the system's efficiency. The main consideration was optimizing the reactor to run at a temperature between 450 C and 550 C. Prior research has shown that this temperature range is needed to have a product with the optimal density and porosity to be used as a soil restoration agent, with minimal energy input.			

Time: 2:15pm -2:40pm	Presenter: Andrew Robert	Thesis Advisor: Dr. Wayne Teel	Project Number: 35-10S
Project Title: <i>Small Biochar Production Systems in Developing Nations</i>			
External Sponsor: Least of These International (LOTI)			
Abstract: Biochar is a fast evolving topic of research around the world. Because of its wide application and potential aid in reducing global warming, biochar is going to be an important technology development. Since biochar has the ability to be used as an energy source and a soil additive, its use is going to be imperative for both 3 rd world and developed countries. This project seeks to take this old technology, biochar, and apply it in new and innovated ways. Through the pyrolysis of waste crop material, the end product is a smokeless, long burning briquette which is used as a cooking fuel in developing nations. This project's goal is to create a renewable, sustainable and economically viable technology in 3 rd world countries.			

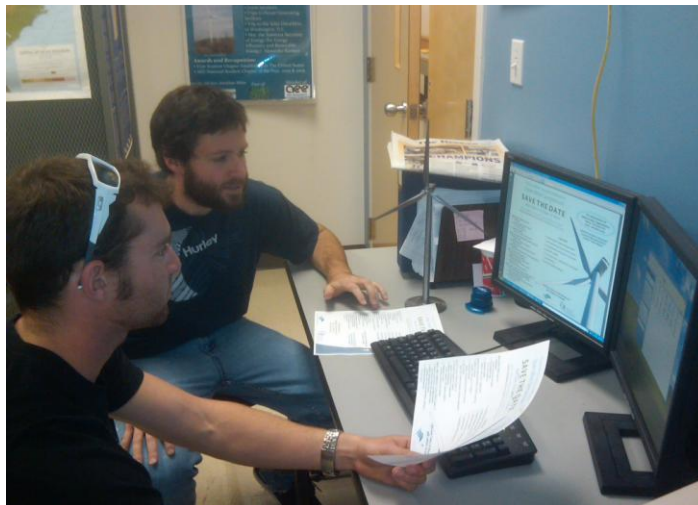
TRACK 7 - ISAT- ROOM 350

Time: 9:00am-9:40am	Presenters: -Steven Florian -Will Shoemaker	Thesis Advisor: Dr. Abdelrahman Rabie	Project Number: 26-10T
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Project Title: *Material Selection for Sustainable Wind Turbines*

Abstract:

Our senior thesis is aimed at Sustainable Material Substitution in Wind Turbines. We have developed a method of sustainable material selection to examine the environmental impact of the materials used in wind turbine constructions. We have broken the turbine into two different sections for analysis focusing on the tower and blade materials. We have analyzed the current materials used by researching and contacting wind turbine companies in the United States and compared these current materials to alternative materials using CES software. We will make our alternate material selections based on our analysis of the critical mechanical and environmental properties of the selected materials.



Time: 9:45am-10:25am	Presenters: -Vernita Fisher -William McCoy	Thesis Advisor: Dr. Mohamed Zarrugh	Project Number: 24-10T
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Project Title: *Effective Implementation of FDA's 21 CFR Part 11 Guidelines on Electronic Tracking in Biopharmaceutical Manufacturing*

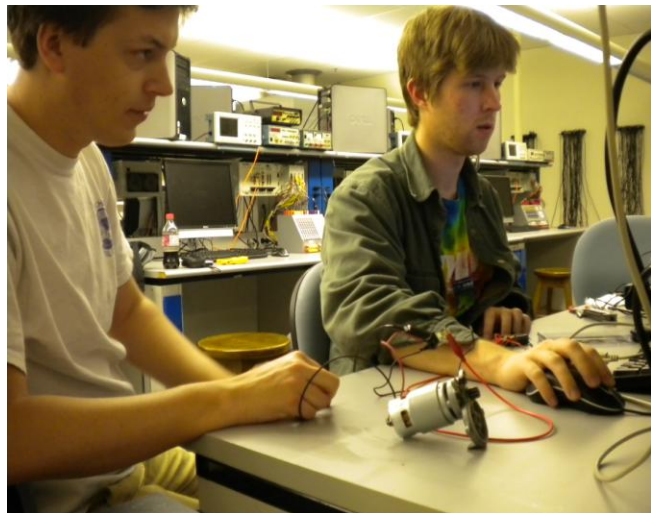
Abstract:

This project explores effective practices for improving pharmaceutical production, quality control/quality assurance, and implementing FDA's 21 CFR Part 11 guidelines on electronic tracking and record keeping. After analyzing FDA's 21 CFR 11 guidelines, a how-to manual was developed to help managers implement process tracking improvements that comply with these guidelines as well as Current Good Manufacturing Process (cGMP) regulatory requirements. The manual could be used by pharmaceutical companies to help them improve production processes, quality control, electronic tracking and record keeping, while complying with the FDA's 21 CFR 11.

ISAT- ROOM 350

Time: 10:30am-11:10am	Presenters: -Aaron Ballew -Lucas Hauschner -Nicholas Moran	Thesis Advisor: Dr. Mohamed Zarrugh	Project Number: 25-10T
Project Title: <i>Development of a Process for Customized Human Joint Replacements</i>			
Abstract: This project explores the idea of a customized joint replacement implant built specifically for an individual. The entire total hip replacement process was analyzed based on interviews with orthopedic surgeons. The analysis spans from sizing the implant, the surgical procedure itself, recovery, and potential failures of the implants. Interviews with local orthopedic surgeons provided first-hand insights on total joint replacement surgery, potential complications of the surgery, and critical improvements needed.			

Time: 11:15am-11:55am	Presenters: -Ryan Luckay -Alexander Sonifrank	Thesis Advisor: Dr. Mohamed Zarrugh	Project Number: 29-10T
Project Title: <i>The Development of a Combat Robot based on Battlebots IQ Criteria</i>			
Abstract: In this project, a combat “robot” was designed and built according to the Battlebots IQ requirements and constraints. A combat robot is not actually a robot, but rather, a Radio Controlled (RC) vehicle that is used to fight other similar vehicles. The Battlebots IQ tournament regulations specify the technical requirements and constraints for robots allowed to compete, as well as rules and regulations for competing in a Battlebots event. Taking into account the schedule and resources available, a 15-pound combat robot class was selected.			



ISAT- ROOM 350

Time: 1:00pm-1:40pm	Presenters: -Arthur Burwell -Darrin Whitley	Thesis Advisor: Dr. Morgan Benton	Project Number: 17-10T
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Project Title: *Spot-A-Ride*

Abstract:

Spot-A-Ride is a website that is designed to encourage carpooling within the JMU community: students, faculty, and staff. This site will allow for users to contact other users to arrange rides for locations on or off campus in exchange for a buck. This alternative mode of transportation will not only help the environment by reducing gasoline consumption and carbon-dioxide emissions, but it will also encourage networking within the JMU community. The website is built using PHP and MySQL using the Zend Framework and the Dojo Toolkit.



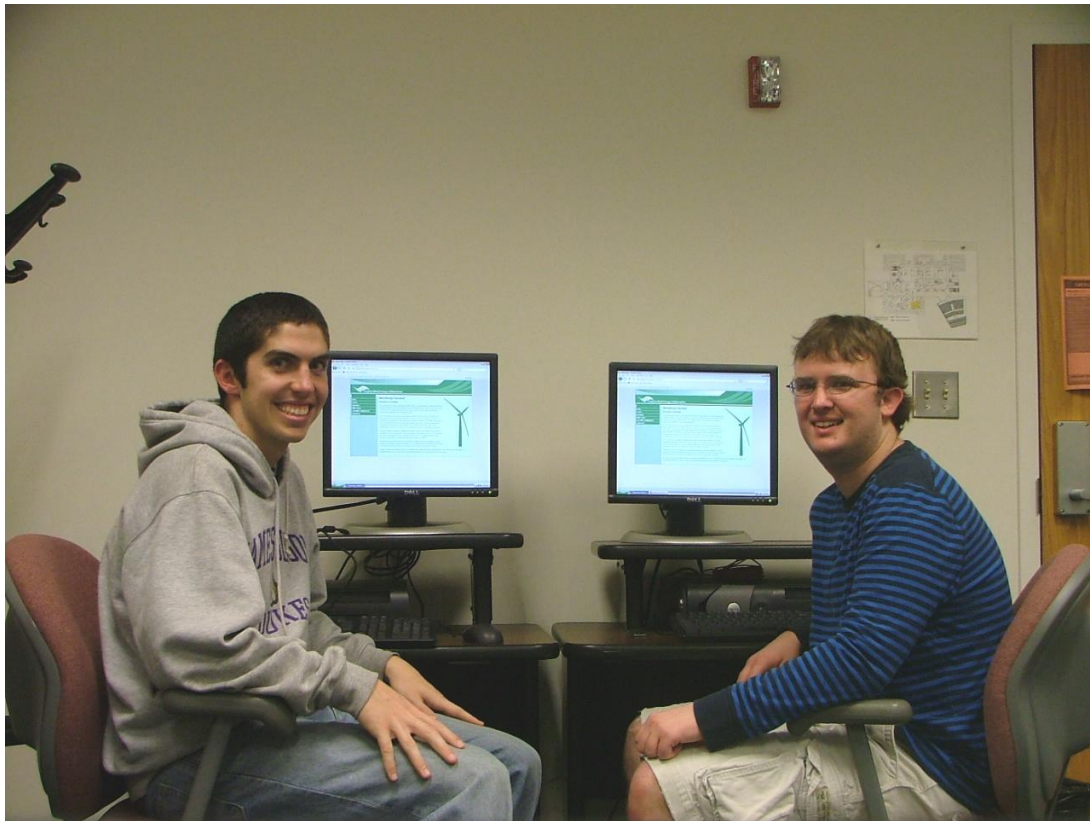
ISAT- ROOM 350

Time: 1:45pm-2:25pm	Presenters: -David Ramsey -Brian Rapp	Thesis Advisor: Dr. Morgan Benton	Project Number: 20-10T
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Project Title: *Development of a Residential Site Assessment and Economic Feasibility Calculator for Behind-the-Meter Wind Energy Generation in Virginia*

Abstract:

This project developed and implemented a public domain, web-based site feasibility analysis tool for behind-the-meter wind power systems. The tool is designed as a site prescreening/suitability calculator for Virginia property owners, and enables them to assess the technical and economic feasibility of a property for wind power before engaging in costly and time consuming site characterization and analysis. The tool was prototyped for the Commonwealth of Virginia, in an effort to help Virginia's Wind Energy Collaborative.



ISAT- ROOM 350

Time: 2:30pm-2:55pm	Presenter: Rachel Palmquist	Thesis Advisor: Dr. Morgan Benton	Project Number: 19-10S
Project Title: <i>OnTrack – An Online Academic Planning Tool for ISAT Majors</i>			
Abstract: <p>Using the ASP.Net MVC framework, Dojo Toolkit and a SQL Server database, OnTrack, a web-based application, was built to assist undergraduate ISAT majors in planning their academic careers while at JMU. This system addresses the need for undergraduate ISAT students to plan their four year academic career within ISAT electronically. OnTrack allows the user to drag and drop classes to a specific year and semester. The application allows the user to see pre-requisites, co-requisites and other requirements associated with each class. It also allows the user to track their progress and completion of the General Education requirements as well as the ISAT curriculum requirements. Challenges overcome in the development of this application included learning the relatively new MVC framework and dealing with hierarchical data in nested-set database associations.</p>			
			

ISAT- ROOM 350

Time: 3:00pm-3:25pm	Presenter: Thomas Haney	Thesis Advisor: Dr. Morgan Benton	Project Number: 18-10S
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Project Title: *UMatter2Us: The Use of Computers in Peer Assessment for Higher Education*

Abstract:

UMatter2Us is an online learning management system (LMS) begun in 2008 by ISAT graduate Thomas Fadoul and advisor Morgan Benton.

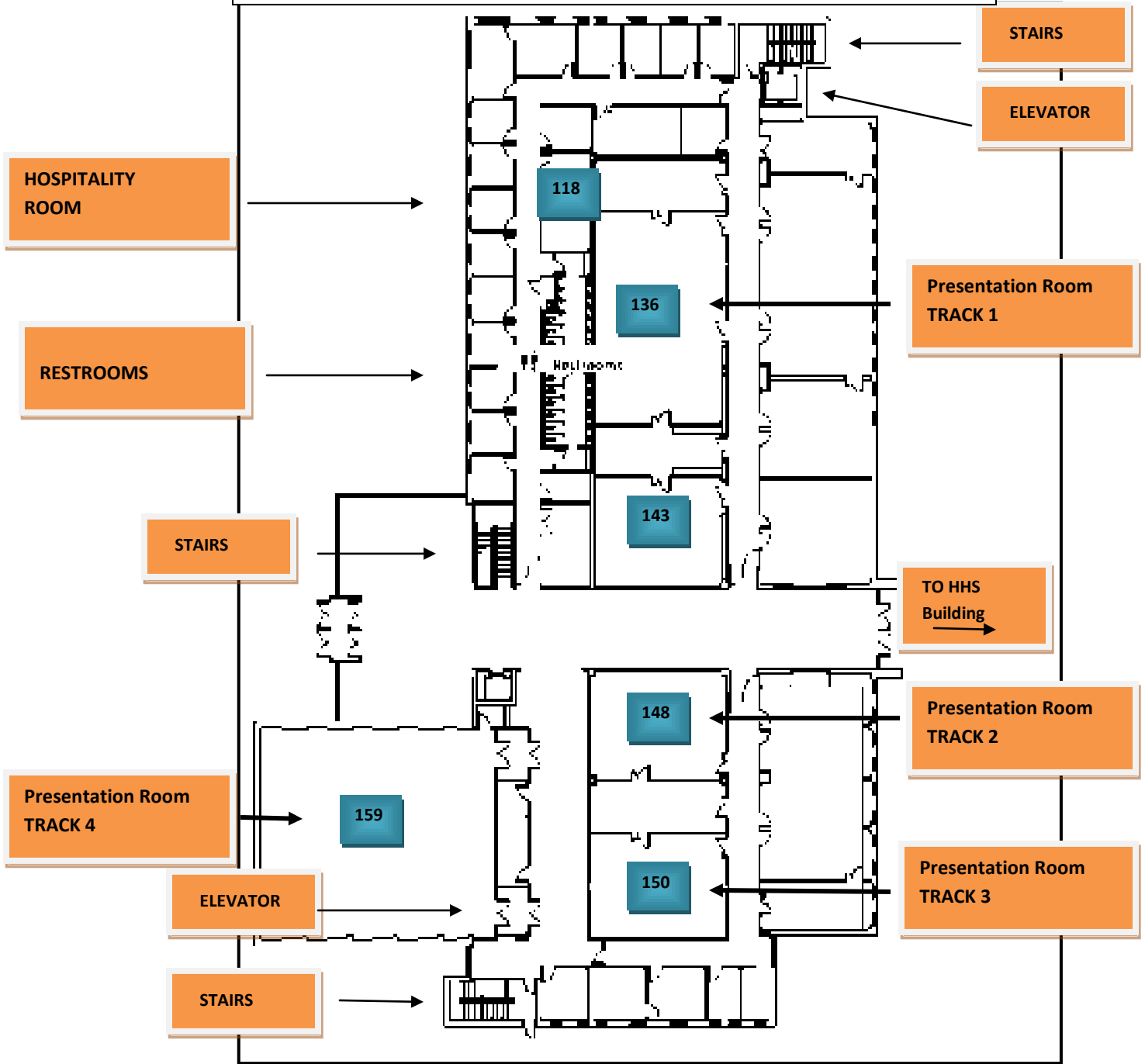
It is implemented using the Ruby on Rails web application framework, along with the Dojo Toolkit for javascript, on top of a MySQL database.

While eventually it is hoped that this system could replace Blackboard, this year the goal was to implement a tool to support collaborative, online peer evaluation.

This presentation will focus on the educational benefits of peer collaborative evaluation, and also demonstrate the progress made to date on the peer evaluation tool in U_Matter2Us.



ISAT/CS Building – 1st Floor Presentation Rooms



ISAT/CS Building – 3rd Floor Presentation Rooms

