Industry & Technology
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Millersville University
SEIZE THE OPPORTUNITY
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ATMAE Student Chapter Takes First Prize

by: Dr. John R. Wright, Jr.

The Robotics Team (ATMAE Student Chapter) at Millersville University took top honors this year at The Association of Technology, Management, and Applied Engineering (ATMAE) Conference's Robotics Competition with their robot named SAM. SAM stands for Semi-Autonomous Marauder. It feels great to finally win this coveted award

I designed the very first ATMAE robotics competition 10 years ago and had never won the Robotics Cup (overall prize) despite participating nearly every year since 2001 and taking second twice. This year's competition involved designing a robot to locate and retrieve metallic cylinders in the sand on Panama City Beach, Florida. Four elements made this competition especially challenging:

1. The Sand – The shifting and loose terrain made for many drive/traction/navigation issues.
2. The Remote Driver Location – For the tele-operated portions of the task, the driver had no direct line of sight and was located more than 100ft away from the robot with his back to the beach.
3. The Autonomous Portion of the Course – The robots had to locate and pick up the objects in an autonomous only zone outlined in the sand.
4. The Competition – The task involved running two robots against each other at the same time in a double elimination style bracketed event.

SAM on the sand

While the performance part was certainly challenging, the evaluation for the grand prize was no less involved. Every team was judged on Performance (40%), Electrical/Control Methodology (15%), Construction/Design (15%), Poster (15%), and Technical Paper (15%). Millersville's team won first place overall (2010 Robotics Cup National Champions), first place Performance, and first place Electrical/Control Methodology. Their Driver, Greg Betz also won the "Best Driver Award."

See more *ATMAE #1* on page 2

Summer 2010: Institute for Critical Thinking and Creativity

by: Dr. Scott A. Warner

This last summer the Department of Industry and Technology hosted a new graduate level institute. The Institute for Critical Thinking and Creativity was designed to help classroom teachers from all subject areas turn theory into practice as they learned how to use the design-based approach to teaching and learning to help students think critically and express creativity. The 26 participants, who came from teaching backgrounds in a variety of content and grade levels, developed strategies to take back to their own classroom to help young people develop abilities to solve problems, design and create, analyze a new situation and react appropriately, and make their own informed decisions. Through hands-on activities, selected readings, group discussions, and short lessons, participants learned how to prepare students to be independent, creative thinkers. Expert guest speakers/instructors explored various aspects of critical thinking and creativity. Those experts included the Institute coordinator Dr. Scott Warner, who provided an overview of critical thinking and creativity in American education. Deborah Smith, a leader in the field of gifted and talented education, documented the use of design-based education across subject areas by showing and discussing the documentary The Sitting Machine. This movie followed Mrs. Smith through a full year of designing and making cardboard sitting machines. Dr. Martin Rayala, a nationally recognized leader in design-based education, spoke about integrating critical thinking and creativity into your curriculum, instruction, and assessment strategies. Jennifer Baker, the design department chairperson

See more *Institute* on page 3


2010 Institute Participants

More ATMAE #1

The students put gobs of hours into this year's entry. Bradley Sensenig, the Chief Programmer for the team, estimated that the robot cost more than $7000 and took approximately 2500 man-hours to prepare it for the national event.

Students involved in the project that represented the University at the conference included: David Oliver (Team Captain), Computer Science, ITEC Electronics/Control Systems Minor; Bradley Sensenig, ITEC Electronics/Control Systems option; Pauline Gemberling, ITEC Electronics/ Control Systems option; Michael Edkin, ITEC Electronics/ Control Systems option; Adam Fox, ITEC Electronics/ Control Systems option; Joshua Jordan, ITEC Electronics/ Control Systems option; Sean Farrow, General Industrial Technology option; Jake Girton, Mechanical Technology option; Mylinda Johe, Technology Education; Greg Betz, Technology Education; Brendon Fowler, Technology Education; and Curtis Rosche, Physics major.

Click the picture to watch a video about the win in Florida!

2010 Team in Panama Beach City

Epsilon Pi Tau Inducts 32, Honors Usiak

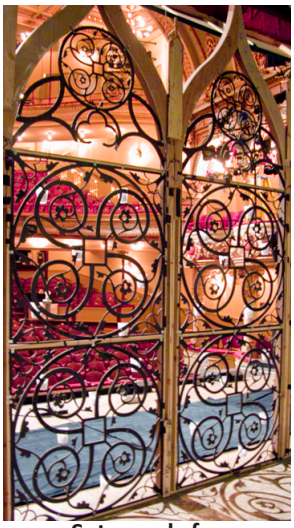
Epsilon Pi Tau, Beta Phi chapter inducted 32 new members into the International Honor Society on November 19, 2010 at Millersville University of Pennsylvania. Students selected for invitation must demonstrate leadership accomplishments or potential and scholarship. Any student in the Deparment of Industry and Technology is eligible for membership in Epsilon Pi Tau if they meet the academic and leadership requirements.

This year, the Beta Phi chapter presented a Certificate of Commendation to Mrs. Vickie Usiak. Mrs. Usiak has volunteered to host our sophomore block technology education students in her Conestoga Elementary classroom. Our students, along with Mrs. Usiak's cooperation have provided three decades of elementary schoolers with a manufacturing experience. The certificate of commendation is awarded to non-members who have made significant contributions to the honor society's fields of interest. Local chapters make the nomination to the Regional Director for approval by the International Office.

The Department of Industry and Technology thanks Mrs. Vicki Usiak for her invaluable years of service!

ITEC Helps out the Fulton Theater

Real-world application intersected with classroom instruction this semester when the department was approached by the Fulton Theater for assistance. The challenge was to create some intricate set panels for use in the Fulton's production of *The Sound of Music.*



Set panels for *The Sound of Music*

Students Matthew Storm and Blake Bardman stepped up to the challenge with the support of professor George Kerekgyarto and Laboratory Technician Bill Horst. The set pieces needed were complicated scrollwork panels to be used throughout the set for the musical. The set designers provided architectural drawings of the panels and the Millersville personnel converted them into CNC files to use on the computer controlled router in the Production Lab.

The immediate problem that became evident was that the computer-generated drawings were not created to account for tool radii. The students spent quite a bit of time redrawing the arcitecturals to compensate for round tooling. With that challenge out of the way, clamping and securing the work pieces to the router proved problematic. Several trial runs were made and a method of securing the light-weight material, Komatex®, to the machine was developed. Once these issues were resolved, only time and lots of machining remained.

The panels, pictured above, appear in many of the scenes. The Lancaster New Era's review of the show talks about the "gorgeous sets," and the department was glad to help out. The university was rewarded with a complimentary ad in the program distributed during the December run. Each person who helped out also received tickets to see the show and the set in action.

2010 Epsilon Pi Tau Inductees

Joseph Robert Assise, Blake A. Bardman, Gregory Adam Betz, Joshua Samuel Bundy, Zachary Adam Cohen, Mike Anthony Croft, Daniel James DellaPietro, Blake Ryan Dutweiler, Erik Lee Everett, Alec Arthur Fassnacht, Matthew Thomas Gardner, Justin Robert Jacobs, Jonathan Nathaniel Jarrett, Michael Timothy Keller, Evan Patrick Kocon, Stefanie L. Kulczyckyj, Christopher Tillman Liddic, James Arthur Loder, Caitlin Lynch Louer, Thomas James Mihalic, Daniel Sean Miller, Trent Daniel Miller, Adam Matthew Parker, Jonathan Ray Risley, Brian Andrew Ruth, Kevin Thomas Schwenk, Brian J. Shea, Erik Robert Sheehan, Sara Shelton, Brett Eugene Slenker, Tim Trinh, Corey Edward Yersak

More Institute

Holding the brains of the operation.

at the Charter High School for Architecture and Design (CHAD) engaged the class with discussions and activities that dealt with creating the physical and cultural environments for supporting critical thinking and creativity. She also dealt with the idea of "branding" your classroom so that it would be immediately identifiable to students. Wendy Green, an award winning technology educator from New Jersey, discussed the knowledge and skills behind critical thinking and creativity. Wendy coordinated and led the group through the creation and performance of historical skits that highlighted the use of the designerly approach to teaching and learning. Finally, Dr. Shawn Gallagher took the group on a journey through the intricacies of the human brain. His discussions explored the functions of the brain and how those functions apply toward critical thinking and creativity.

The Institute was designed to serve as a test platform for both changes in the content and delivery of graduate courses being offered through the Department. Currently efforts are underway to make the Institute for Critical Thinking and Creativity into a permanent course in the changing graduate program of study. **Plans are also underway for a follow-up Institute for the summer of 2011 that will focus on the Design and Technology Curriculum as it is taught in Great Britain.** The guest speakers/instructors will be leaders from England in the field of Design and Technology.

North Side Renovations Set to Begin

by: Jim Deisley

Since the renovation and expansion completed in 2004, the north side of Osburn Hall tends to become a water basin after heavy rain often flooding faculty offices and laboratories. I assisted Mr. Ken Brent, campus architect, in arranging an exterior renovation of this north end of the building. The final drawings have been completed and approved, and the project is currently out for bids. This work will entail rerouting the sidewalk to contour Pucillo Drive and installing steps down to the second floor north entrance. There will also be an asphalt pad that slopes away from the building outside of the Metals Laboratory with two rain inlet boxes. To help with excessive rainwater, the area will feature a decorative stone garden that will function as passive runoff management.

It appears as though this work will begin sometime early March and should be completed in a in a timely fashion. This should permanently alleviate the building flooding and wet carpets in the office complex and metals lab.

Looking Forward to New Opportunities

by: Dr. Mark R. Snyder

Dr. Mark R. Snyder

This is my first term as the Industrial Technology program coordinator but I look forward to the opportunity to serve the Department of Industry & Technology in this role. This is a new responsibility for me and I will do my best to represent the faculty and students of the ITEC program while working with the coordinators from the other departmental divisions as well. Although I am now the primary advocate for ITEC, I know that each area (Occupational Safety and Environmental Health, Technology Education, and Industrial Technology) has a valuable role to play in the future of the department.

During the summer, Dr. John Wright completed his responsibilities as the previous ITEC coordinator by wrapping up loose ends in the process of our accreditation through the Association of Technology Management and Applied Engineering (ATMAE). While we received accreditation (with flying colors) over a year ago, the accrediting body reported in 2008 that we needed to address minor compliance issues related to the new Nanofabrication Technology option we offer in conjunction with Penn State University. Dr. John Wright, assisted by Dr. Ken DeLucca, completed the steps required to address these concerns over partial compliance and the necessary paperwork was submitted in early August.

The ITEC Advisory Council met September 28, 2010 at 6 pm in Room 200, Osburn Hall. Mr. John Matthews, Business Development Manager, Distributed Systems Servicesassumed the role of Advisory Council Chair and we welcome his leadership in that capacity. Mr. Matthews, and the Advisory Council, is particularly interested in exploring creative ways for ITEC students to participate in experiential learning activities through industry partnerships. We are open to discussing ideas that may, perhaps, reinvent the way traditional co-op and internship experiences are offered through the ITEC program.

Summer 2011 Class Offerings

Summer I: May 16 through June 10, 2011

- ITEC 140: Bio-related Technologies
- ITEC 301: Technology and Its Impact on Humans
- ITEC 303: Tech Assessment: The Amish and Others
- ITEC 356: Desktop Publishing
- ITEC 515: ADV PROB: Desktop Publishing
- OSEH 440: Internship in Industry

Summer II: June 13 through July 15, 2011

- EDTE 590: Information Literacy Through Guided Inquiry
- ITEC 301: Technology and Its Impact on Humans
- OSEH 440: Internship in Industry

Summer III: July 18 through August 19, 2011

- ITEC 586: Institute for Design-Based Education (7/18-22)

Please see the department Web site for more information.
http://www.millersville.edu/aest/

Litowitz Puts the Wraps on the ROV

Dr. Len Litowitz and his team of student researchers completed the initial build of a remotely operated vehicle as part of a Keystone Grant project. Litowitz and his students used their interests in robotics and automation to convert an ATV into a surveillance platform.

The purpose of the surveillance platform is to go out ahead of ground troops to seek out improvised explosive devices. Having a range of approximately one-half mile, the vehicle can go out ahead of foot patrols to detect hazards to increase the safety of the soldiers.

While the base vehicle was purchased locally, all of the modifications were done by students in the department. Students automated the forward and reverse controls, braking, and steering. This was accomplished with long-range antenna and high-end remote controls. Students made modifications to the frame and other metal parts of the vehicle which involved accurate welding and fabrication.

The next steps for the vehicle is to introduce it to those interested in taking the work done here and possibly developing for production. "To the extent we can have our robots fighting those who would do our soldiers harm," says Litowitz, "I think it has a lot of potential."

To see more information about ROV, including footage showing its operation, please click on the image to the right. This will take you to the the Pennsylvania Media Hub Web site to view the Keystone Grant wrap-up video.

TECA Cleans Up at Regional Conference

Thirty-two technology education majors and their advisors hosted this year's TECA Eastern Regional Conference in Virginia Beach October 17 - 19, 2010. TECA is the student organization for technology education majors and works closely with the International Technology and Engineering Education Association. Here are this year's results from the many competitions that took place over that weekend. As always, MU-TECA can be proud of their performance.

First Place Awards - *Problem Solving:* Andrew Ash, Dale Shoop, and Tristan Noggle. *Instructional Module:* Marty O'Hara, Jon Jarrett, and Andrew Kauffman.

Second Place Awards - *Manufacturing:* Erica Schmuck, Cat Edwards, Blake Bardman, Kevin Bond, Ryan Hough, Brandon Byer, and Nathan Hanson. *Elementary Design:* Leanna Carstetter, Chris Liddic, and Erica Schmuck. *Automated Systems:* Korbin Shoemaker, Mike Keller, Bryan Parrish, and Tom Flick. *Poster Session:* Korbin Shoemaker, Bryan Parrish, and Tom Flick.

Third Place Award - *Transportation:* Will Trombley, Joe Shapiro, Greg Betz, and Corey Yersak.

Specially Funded Camp Programs

by: Dr. Barry David, Department Chair

The halls of Osburn Hall were surely abuzz this past summer. While we typically have school-age kids taking a range of technology summer camps, this year, two additional camp programs provided students with opportunities they might not have otherwise had.

Migrant students from the area attended a week-long residential camp partially funded by a grant from the National Science Foundation (Grant No. DUE-0603367). The 21 campers experienced technology related career opportunities while working primarily with Lego® educational products. The students (some with limited English language skills) followed diagrammatic plans as they created mechanisms controlled by computer programs. They learned to input computer code to write programs that controlled the automated devices they assembled. During the camp the students developed an understanding of the connections between their academic subject matter and the laboratory applications they experienced. The students also received information about career opportunities in applied engineering and technology.

The second externally funded summer camp was in collaboration with the Benjamin Wiley Partnership Program. The BWPP is a statewide multi-year initiative, to help promising 10th graders from urban high schools attend college. Students have the chance to work with university faculty and staff to develop the academic and social skills needed to succeed in college. The Department of Industry and Technology component was funded by a grant from the PA Department of Economic and Community Development and worked with rising eleventh graders from Lancaster's J.P. McCaskey High School. The camp provided 33 students with career decision-making information relative to advanced manufacturing though the designing, building and testing of robotic devices. The goal of the camp was to help fill the pipeline of students enrolled in advanced manufacturing type associate and bachelor degree programs in an effort to help restore the technology workforce in Pennsylvania.

Millersville University
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