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## Technovations in Transportation

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### 2010 ASABE Annual International Meeting



The American Society of Agricultural and Biological Engineers (ASABE) is an organization of students and professionals in education and scientific communities committed to the advancement of engineering applicable to agricultural, food, and biological systems. This year, the annual international meeting was held at the David L. Lawrence Convention Center in Pittsburgh, PA, June 21- 23, 2010. NIATT sent Randy Maglinao (pictured left at work in the lab) to attend the conference and to present two papers about the research he has been working on under the guidance of Dr. Brian He, Principal Investigator for the projects.

The first presentation titled "Recent Developments in Chemical Processes in Converting Glycerol to Value-added Products" was a summary of the comprehensive review on the recent developments in the thermochemical conversion of glycerol to value-added products. Randy talked about a comparison of properties between crude and pure glycerol, and the effects of the impurities on the yield of the products.

The second presentation was titled "Thermochemical Conversion of Glycerol from Biodiesel Production to Primary Alcohols." Randy discussed the results of the on-going research on the thermochemical conversion of crude glycerol to alcohols. He also talked about the progress in the use of metal catalysts, and improving the selectivity of the process towards producing ethanol and propylene glycol.

The people he was able to talk with after his presentations showed interest with the process of producing alcohols from glycerol. The technical sessions helped broaden his perspective on what others are doing and how they are conducting their research. He met Dr. Yuanhui Zhang from the University of Illinois at one of the poster sessions, and his group is working on producing bio-crude from algae through hydrothermal process. He had discussions with professors and fellow graduate students from other Universities about their projects and research, such as catalytic conversion of glycerol to acrolein, recovering ammonia emissions, measuring hydrocarbons from air exhaust of composting facilities, hydrocarbon emissions, and development of a control system for a pilot-scale biomass gasification system. He also had a chance to meet a few of his colleagues and former professors from the University of the Philippines Los Baños and talk about the recent changes with

each of their respective research projects.

Randy said, "I am grateful that NIATT gave me this chance. I can definitely say that it is one of the experiences that I will not forget."

For additional information on this project see  
[http://www.webpages.uidaho.edu/niatt/Project\\_Detail.asp?Project\\_ID=186](http://www.webpages.uidaho.edu/niatt/Project_Detail.asp?Project_ID=186).

## Traffic Signal Systems Committee Meeting

NIATT hosted the summer meeting of the Transportation Research Board (TRB) Traffic Signal Systems Committee meetings held on the University of Idaho campus July 18 through July 20, 2010. One full day of the meeting was devoted to current best practices and innovations in traffic signal education and training, including:

- What do university students, engineers and technicians in practice need to know and understand about traffic signal systems,
- What resources are available or needed to improve the skills and competencies of engineers and technicians in practice, of university faculty, and of university students, and
- How can the Traffic Signal Systems Committee encourage the development of new educational materials, curriculum, tools, supporting research, and other activities to improve education and training in traffic signal systems?

NIATT researchers Ahmed Abdel-Rahim, Mike Dixon, Steve Beyerlein, Howard Cooley, and Michael Kyte used the meeting to showcase several education projects related to traffic signal systems including the MOST project and the TransEd project. The team solicited feedback from the signal systems professionals attending the summer meeting, an important part of the work program for both projects. An expanded version of this day long workshop will be held at the annual meeting of the Transportation Research Board in January 2011.

## Fall Fiesta!



NIATT hosted a Fall Fiesta to welcome back students, faculty, and staff for the 2010-2011 academic year in September. NIATT served the "Moscow Mile" – a six foot party burrito from Patty's Kitchen. The snowmobile team didn't have to be

told twice there was food available (left). Civil engineering students and faculty were not far behind (right). Not a scrap left after this fiesta!

## NIATT Welcomes Dan Cordon as Development Engineer



NIATT is pleased to announce Dan Cordon will be the Development Engineer for NIATT beginning January 10, 2011.

Dan is no stranger to NIATT. He has been involved in NIATT research for the past 10 years. Dan received his PhD this past year. His Master's Thesis was titled "Multi-Fuel Platform and Test Protocols for Over-the-Road Evaluation of Catalytic Engine Technology" and his Doctoral Dissertation was titled "Exploring the Operating Limits and Performance of Catalytic Ignition with Aqueous Ethanol and Heavy Fuels." Dan has managed the Small Engine Research Engine since 2006.

Dan not only brings a wealth of experience as a researcher, but he has also made a name for himself as an instructor. In 2009, Dan was awarded the University of Idaho Outstanding Graduate Student Teacher Award. In 2004, Dan was named NIATT's Student-of-the-Year.

## Advanced Accessible Pedestrian System Installation at 6th & Deakin in the Works

With the introduction of the Advanced Accessible Pedestrian System (AAPS) that is now being manufactured by Campbell Company of Boise, ID, Dr. Richard Wall is exploring the possibility of having an evaluation system installed at the intersection at 6th and Deakin Streets in Moscow, ID that provides access to the University of Idaho campus. There have been four AAPS installations in the St. Paul, Minnesota area, two of which since last February.

The intersection at 6th and Deakin Streets was selected because of the high volume of pedestrian traffic and the relatively low volume of vehicular traffic. A laboratory demonstration of the equipment is setup in the Gauss-Johnson Engineering Building. Kevin Lilly and Tyler Palmer from the City of Moscow stopped by for a demonstration provided by Dr. Wall (left) and Cody Browne (right), electrical engineering graduate student.



An installation of the AAPS system at a site close to the facilities where the AAPS design teams works is a great opportunity for its developers to showcase the graduate student's work culminating six years of research and development effort. A recent NIATT report that describes the operation of the system is available on line at

[http://www.webpages.uidaho.edu/niatt/research/Final\\_Reports/KLK715\\_N09-09\\_Final.pdf](http://www.webpages.uidaho.edu/niatt/research/Final_Reports/KLK715_N09-09_Final.pdf).

Equipment for the installation is being donated by Campbell Company. The installation date hasn't been determined yet, but is expected to be completed within the next month.

## 2010 FSAE Northwest Conference



Friday, November 5, 2010, three members (left to right: Chad Barnes, Corey Bellinger, and Zack Porter) of the Hybrid FSAE Team attended a number of events at the 2010 FSAE Northwest Conference in Portland, OR. The experience will directly benefit the current team and improve the performance of future teams.

The day began with a lecture from Neil Roberts, a current FSAE judge and one of the top racing engineers in the country. His lecture was focused on vehicle design and race team dynamics. The presentation exploited some of the necessities and required design methodology of the racing engineer. This presentation will be adopted into the hybrid program as a reference and motivation for all team members curious about the best way to enter a career as a race engineer.

The most crucial lesson with respect to team dynamics is electing a single chief engineer for the team. The chief engineer is the soul dictator of the team and will effectively have the final say in the vehicle design. This is a feature that the team must implement for future teams to run effectively. With respect to vehicle design, Mr. Roberts made it undoubtedly clear that the suspension must be designed before the frame. Currently, the UI team's suspension is being designed around the frame. This limits what the suspension may accomplish, and ultimately hinders the vehicle's performance.

The second event was to a small motorsports facility, which concentrates on the bodywork of high performance formula cars. The team was given a tour of the facility. The process of creating composite components (body, diffuser, wings, etc.) was highly detailed and a long process. The exposure to the limitations, and abilities, of manufacturing composite racing products will provide the body team an enlightened insight into product manufacturability.

The final, and arguably the most fun event of the trip, was a visit to Pat's Acres Racing Complex. This racing complex featured rental go-karts capable of reaching speeds of 50 mph. The speed of these karts is comparable to what the Hybrid FSAE Team will face at competition this spring. Each of the three attending team members got seat time in the karts. Accumulating seat time and developing competent drivers will be essential to a successful performance at competition. Pat's Acres provided a highly cost effective solution to gaining valuable driving time.

The lecture by Neil Roberts, coupled with the opportunity to see full-scale Formula 1000 race cars being manufactured, resulted in an ecstatic and motivated team. Heightened levels of motivation will ultimately dictate the success of the Idaho Hybrid FSAE Team. Two senior team members, Chad and Zach, attended the events. More importantly, one dedicated underclassman, Corey, attended the events. Corey is already developing ideas to ensure a more functional senior/underclassman interaction, to better transfer knowledge and enthusiasm of the formula project. Overall, the 3 events were tremendously successful. Corey said, "In future years, the team should continue to encourage participation in the event."

For more information on this project see  
[http://www.webpages.uidaho.edu/niatt/Project\\_Detail.asp?Project\\_ID=185](http://www.webpages.uidaho.edu/niatt/Project_Detail.asp?Project_ID=185).

For more information about the FSAE Hybrid Team and Senior Design Project see  
<http://seniordesign.engr.uidaho.edu/2010-2011/hybridformula/>

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