Michigan Ohio
University Transportation Center

Alternate energy and system mobility to stimulate economic development

Volume 5, Issue 2 **Summer 2011**

Pre-College Campers = Future Transportation Professionals

Camp Coordinator James Buri and Pre-College Program Director, Pamela Rhoades Todd stand with proud camp participants at the end of a very enriching summer experience! **Congratulations to all of the 2011 TRANSIT Campers** on a job well done!

Now in its fifth year , TRANSIT Summer Camp, engaged metropolitan Detroit area students in a week of innovative programming at the University of Detroit Mercy (UDM), exploring Transportation Engineering as a field of study and career choice. This year's participants were a unique group - all male, with the exception of one female, each from different high schools. There were two students from the Downriver community who participated through the generous support of the Colina Foundation.

Safe, secure, and efficient transportation systems are essential to the economic viability, quality of life, and strength of our nation. Safe, secure, and efficient transportation systems are essential to the economic viability, quality of life, and strength of our nation Hands on projects, guest speakers from industry, field trips and expert university input from Civil and Manufacturing Engineers , as well as Planners and Community Development advocates provided information that opened up a whole new area of study and career paths for participants.

Below: Ms. Cheryl Gregory, a Traffic Engineer at Spalding DeDecker, brought equipment allowing students to test how velocity and mass can affect an accident.

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University of Detroit Mercy, Engineering Bldg.
4001 W. McNichols Road, Detroit, MI 48221
Office: (313) 993-1510 Fax: (313) 993-1187

http://mioh-utc.udmercy.edu

Director: Dr. Leo E. Hanifin
Asst. Director: Patricia A. Martinico
E-mail: martinpa@udmercy.edu

Looking back with satisfaction . . And looking ahead with hope.

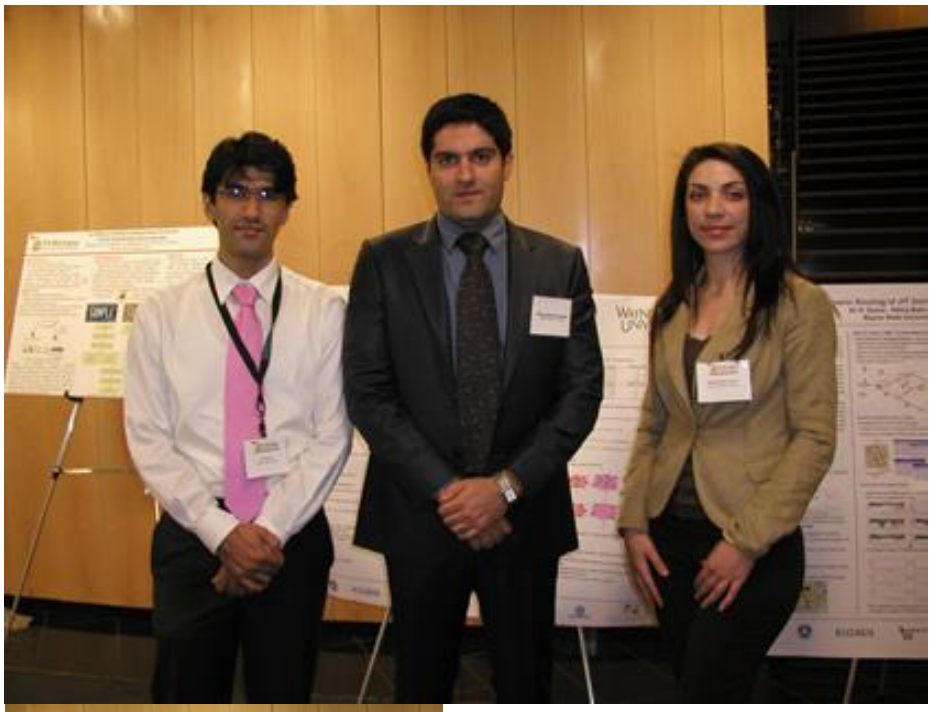
This is my last 'message from the Director' as the leader of the Michigan Ohio University Transportation Center. The Department of Transportation has terminated all current UTC's (over 60), and will fund 22 new ones going forward. While MIOH will cease to exist, the passion and commitment of the many transportation professionals at our five universities — faculty, staff and students — will continue. We will also carry on our efforts to serve the nation with new transportation knowledge and insights, and excellent transportation education and graduates, all aimed at making our nation's transportation systems smarter, more efficient, more responsive, more affordable. Four of the five MIOH schools have joined the Mineta National Transit Research Consortium and are continuing our quests for transit excellence through that "next generation UTC."

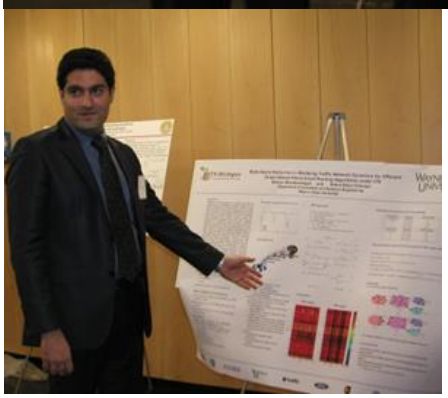
During our five years in existence, the MIOH UTC has completed twenty eight research projects, four educational projects and five K12 outreach programs. The many results of these projects are posted on the MIOH UTC website, http://mioh-utc.udmercy.edu. The investment of the US DOT of $2,221,600 Million was leveraged with matching funds of over $3,083,750 from our university and corporate partners and the Michigan Department of Transportation. More importantly, the results of our research and the careers of the graduates of our educational programs have advanced, and will continue to advance, the nation's capabilities in alternative fuels, intelligent transportation, and transportation systems efficiency.

Dr. Leo E. Hanifin, Director
MIOH University Transportation Center
leo.hanifin@udmercy.edu

MIOH UTC Students Present Research at the ITS-Michigan annual meeting June 1, 2011

Student researchers supported by MIOH UTC projects swept the Intelligent Transportation Society-Michigan 2011 **Gold, Silver, and Bronze Student Paper Awards** for submitting the top ranked abstracts. Below (left to right) are Bronze winner Ali Gunar, Wayne State University; Gold winner Mahyar Movahednejad, Wayne State University; and Silver winner Malok Alamir Tamer, University of Detroit Mercy. Additionally each Paper Award winner's poster was accepted for presentation as part of the poster session. Below are pictures from the poster session.





*Above: Gold Paper Award winner for top-ranked abstract, **Mahyar Movahednejad**, a WSU graduate student presents "State-Space Reduction in Modeling Traffic Network Dynamics for Efficient Graph-Based Hierarchical Routing Algorithms under ITS." Mahyar's research relates to MIOH UTC funded projects of Dr. Ratna Chinnam and Dr. Alper Murat.*

*Right: Bronze Paper Award winner, **Ali Riza Guner**, WSU graduate student presents "Dynamic Routing Policies in Stochastic Time -Dependent Networks Under ITS." This is the second consecutive year Ali has earned the Bronze Paper Award.*

*Below: Silver Paper Award winner **Malok Alamir Tamer** (right), a UDM graduate student, with her research team and Dr. Nizar Al-Holou at their poster presentation of "ITS-based Eco-Routing for Car Navigation Systems."*

Above: ***2011 MIOH UTC Outstanding Student of the Year,*** Mohamad Abdul-Hak (left) receives a US DOT Award. Bestowing the award is (right) Gregory D. Winfree, Deputy Administrator of the Research and Innovative Technology Administration.

2011 MIOH UTC Outstanding Student of the Year

Mohamad Abdul-Hak is a doctoral student in the Electrical & Computer Engineering Department at the University of Detroit Mercy. Mohamad received his bachelors and masters degrees with honors in Electrical & Computer Engineering from Wayne State University and the University of Michigan respectively.

Under the leadership of Dr. Nizar Al-Holou, Chairperson of UDM's Electrical & Computer Engineering Department, Mohamad Abdul-Hak contributed extensively to two MIOH UTC funded research projects. The first one was "A New Approach to Enhance and Evaluate the Performance of Vehicle-Infrastructure Integration and ITS Communication Systems" and the second was **"**A Multi-Dimensional Model for Vehicle Impact on Traffic Safety, Congestion, and Environment."

Mohamad's current research efforts are to develop a "Predictive Intelligent Energy Management System." This system provides the on -board navigation unit of an electric vehicle with real-time traffic information which is then used to optimize the route s election based on reduced energy consumption and emissions, resulting in improved air quality. His doctoral dissertation working title is: "Predictive Intelligent Energy Management System to Enhance the Performance of Electric and Plug-in Hybrid Vehicles."

Mohamad has two patents pending relative to transmission oil pressure/ flow in hybrid electric vehicles.

Research Results

Enabling Congestion Avoidance and Reduction in the Michigan-Ohio Transportation Network to Improve Supply Chain Efficiency: Freight ATIS

Research conducted by: Dr.Ratna Babu Chinnam, WSU, Dr. Alper Murat, WSU and Dr. Gregory Ulferts, UDM.

This project is the fifth in a five project series on this topic. The complete reports located on the MIOH UTC website at: http://mioh-utc.udmercy.edu/research/sc-02/index.htm

The objective of this study was to develop methods for routing vehicles in stochastic road network environments representative of real-world conditions.

Given an origin and customer set, the traveling salesman problem is to decide which arc to choose at each decision node (customer locations and/or intersections) such that the expected total travel time (or another performance criteria) is minimized while visiting all customers in their specified delivery time windows.

The researchers addressed the problem of planning milk-run tours for JIT production subject to hard time windows in congested road networks. They modeled the milk-run tours as a Traveling Salesman Problem with hard time windows. The road network congestion is represented through random network arc travel times and time-dependent congestion states. They evaluated the developed approach on a real case study application using the road network from Southeast Michigan. The case study corresponded to an automotive JIT production system where an OEM's DC is replenished by milk-run pickup/deliveries from multiple suppliers.

The researchers compared the selected robust tours with those of the static routing policy between pair of sites and quantified the benefits of using dynamic policy. The case study results indicate that using dynamic routing policy between milk run visit not only decreases transportation cost (measured by trip time), but also increases the delivery service level performance (measured by on-time delivery).

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MIOH UTC wishes to thank Dr. Snehamay Khasnabis for his service in representing Wayne State University on the MIOH UTC Operating Committee since its inception. We wish him well in his retirement. Additionally we welcome Dr. Peter Savolinen as the new representative of Wayne State University.

STEPS Camp (**S**cience **T**echnology and **E**ngineering **P**review **S**ummer) is an opportunity for girls to learn more about what engineers do in their careers. Program participants build and program a robot, while gaining an understanding of transportation systems, manufacturing techniques, robotic control systems, circuits and sensors. It is open to female high school students currently in the 9th through 11th graders. A Minimum 2.0 GPA is required. Enrollment is limited.

Camp dates: June 2012

TRANSIT is a one week commuter camp for high school students, currently in 9th-11th grades, who want to learn about the world of transportation, a field of study within Civil Engineering. Activities include: impact of transportation on communities; smart cars and how they communicate with smart highways; traffic simulation software used to make intersections safer; and how transit systems can bring us together in southeast Michigan.

Camp dates: July 2012

For more information, to request a brochure/application, or to inquire about scholarships please contact the Director of Pre-College Programs in care of: precollegeprograms@udmercy.edu

Inside this issue…

MIOH UTC
Engineering Bldg. 126
University of Detroit Mercy
4001 W. McNichols Road
Detroit, MI 48221-3038