



CCITT Newsletter

Moving Research to Realization for Surface Transportation

Volume 2 Issue 2 Fall 2009



***Chambers Hall —
CCITT's New Home in the
Northwestern University
Transportation Center***

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Director's Note

CCITT Gets New Home

This past year for CCITT was a year of change, to the benefit of Northwestern faculty and researchers, and to the transportation community at large. In July 2009,



Bret Johnson
Director

CCITT moved under the wing of the Northwestern University Transportation Center, located within the McCormick School of Engineering and Applied Science.

CCITT's primary goal is to enhance the transfer and adoption of University-developed innovations by the public and private transportation providers, operators, and equipment manufacturers. As an integral member of the Transportation Center (TC), CCITT will have access to more immediate resources to fulfill its mission.

Since 1954, the TC has been recognized as a leading interdisciplinary academic and research institution. The TC is dedicated to the long term improvement of domestic and international transportation and distribution systems and focuses on the complex range of issues affecting the movement of people, materials, energy and information and the policies, operations, management and economics that govern such movements. The TC benefits from the expertise and guidance of a prestigious group of industry leaders who serve on its Business Advisory Committee (BAC). The BAC is comprised of senior-level executives representing all modes of transportation and a wide range of shipper and logistics businesses including freight forwarders, financial institutions, consulting firms and trade organizations.

In the past six months, CCITT has begun to put the

TC's expertise and relationships to work. As a result, we expect several new research collaborations to emerge in early 2010.

CCITT Student Intern Profile

Name: Carlos Calegari

Class: 2010

Major: Industrial Engineering **Minor:** Economics

Hometown: Mission Viejo, CA

Carlos Calegari conducted extensive market research, working toward a product development plan for Industrial Engineering and Management Science Professor Diego Klabjan. In addition to online research, Calegari contacted key people in the railroad industry, primarily Class 1 railroads, to understand their needs for an automated gang scheduling system. Railways currently incur significant expenses related to the deterioration of the materials used to build their transportation systems. Groups of workers, called gangs, are constantly moving to various track sections to repair particular deficiencies in the materials. The scheduling process is often manual and tedious which leads to higher and unnecessary expenses. Calegari hopes his research will help lead to the launch of a software application that will help railways operate more efficiently.

Carlos Calegari was hired for this position through CCITT's initiative to provide an opportunity for students to work in the field of transportation. At the conclusion of his internship, he delivered a product marketing plan and gave a PowerPoint presentation to the principal investigators. Calegari enjoyed the research and found that the various tools and analysis techniques used as part of this internship are applicable to what he hopes to do as a career. He would like to work on a rotational technical or sales training program utilizing his leadership and management skills at a big corporation in the Chicago area.

CCITT Congratulates Professor Morris E. Fine For Outstanding Achievement Award

Morris E. Fine, the Walter P. Murphy and Technological Institute Professor Emeritus of Materials Science and Engineering, has been selected as a recipient of the Outstanding Achievement Award from the University of Minnesota. This honor recognizes graduates who have attained unusual distinction in their chosen fields, professions, or in public service, and who have demonstrated outstanding achievement and leadership on a community, state, national, or international level.

With funding from CCITT recently and other sources such as FHWA, NSF and the Infrastructure Technology Institute, Professor Fine's latest innovation is the culmination of a theory that he and one of his former students developed in 1969. Fine has been working closely with Dr. Semyon Vaynman to develop a steel that is much more fracture tough at cryogenic temperatures than other commercially available steels for infrastructure and construction. The researchers are working with Union Tank Car Company to investigate the use of this steel for transporting liquid chlorine. The current standard for steel used to make bridges and tank cars requires steel to withstand 35 foot-pounds impact at -10°F in a Charpy test, whereas Fine's and Vaynman's new steel has been shown to withstand impact of 350 foot-pounds down to -60° without fracturing.

As a recipient of the Outstanding Achievement Award, Professor Fine's name will be engraved on the school's Alumni Wall of Honor. Just over 1,000



Morris E. Fine, the Walter P. Murphy & Technological Institute Professor Emeritus of Materials Science and Engineering.

names can be seen on the school's monument, indicating that these graduates have received the University's highest honor. Professor Fine is flattered to be granted such a prestigious award.

Fine received his PhD in physical metallurgy from the University of Minnesota in 1943. After working on the Manhattan Project in Chicago and Los Alamos, he worked for Bell Labs until 1954, when he came to Northwestern. He is a founder of Northwestern's materials science and engineering department.

Professor Fine is a member of the National Academy of Engineering and the American Academy of Arts

and Sciences. He is a fellow of the Metals, Minerals, and Materials Society (TMS), ASM International, the American Ceramic Society, and the American Physical Society.

Fine continues to publish and has more than 300 papers to his credit. He has received numerous awards in addition to this most recent one. Professor Fine earned the TMS 2009 Application to Practice Award for research that led to a new steel with better corrosion resistance, toughness, and welding properties. This steel was selected to be used for a new bridge in northern Illinois.

CCITT lauds Professor Fine for receiving the Outstanding Achievement Award. His list of accomplishments and impact on the industry and lives of his students is tremendous.

Undergraduate Makes Important Contribution to Research Project

The bulk of Phase II of Dr. Professor Yu “Marco” Nie’s “Reliable Route Guidance” research is complete thanks to the help of undergraduate Research Assistant Joe Zissman. Member of the Class of 2011 and Civil Engineering major, Zissman worked at the Chicago Transit Authority (CTA) headquarters for 11 weeks this past summer. The project entailed extensive work with databases and programming, which led to a prototype code used to calculate average speeds of buses traveling on arterial streets in Chicago and the surrounding area.

The main goal of Dr. Nie’s project is to enhance travel reliability by providing users with reliable route guidance produced from newly developed routing algorithms that are validated and implemented with real traffic data. Prior to this phase of the project, the Illinois Department of Transportation (IDOT) had provided traffic sensor “loop” data for expressways in the area. By collaborating with the CTA, Dr. Nie and Zissman were able to achieve a greater degree of data coverage of the study area by tracking bus travel times on arterial streets.

Combining historical highway and bus automatic vehicle locator (AVL) data helps the researchers come up with a Chicago Testbed for Reliable Routing (CTR) that can be useful for individuals, trucking companies, parcel delivery services, etc. The tool will provide estimates for arrival times based on time of departure and vice-versa, allowing users to confidently plan their travel.

Though Zissman’s internship is complete, Professor Nie continues to receive CTA Bus Tracker data on a monthly basis. Nie continues to analyze the data to ensure predictions for all arterial streets are as accurate as possible. Dr. Nie also intends to conduct a market survey as part of this phase of the research project. Upon investigation of target users, he hopes to determine users’ attitudes, needs and uses for travel reliability information.

The process of sharing information and resources in a collaborative effort, such as this one with the CTA, can be valuable to both parties involved. Michael Haynes, Project Manager of the Technology Management Department at the CTA, agrees that understanding this data will be a valuable asset to the CTA. It is already seen as an important resource internally, and the CTA



Joe Zissman, Class of 2011 - Civil Engineering

is doing all the necessary work on the back end to possibly make the information available to users publicly. In an effort to drive the adoption of reliable routing techniques in the commercial sector, Dr. Nie hopes to collaborate with Google, NavTeq, and other transportation information companies on the further development and use of this tool.

Zissman called his internship with the CTA, “a great learning experience,” in that he was able to develop a skill set he had not otherwise been exposed to. After graduating from Northwestern, Zissman hopes to move back to the Boston area to start his career as an Urban Planner.

CCITT Launches Speaker Series

In November 2009, Mil Ovan, Senior Vice President and Co-founder of Firefly Energy Inc., kicked off the CCITT “Technology Commercialization Speaker Series.” Mil Ovan is a 1982 Kellogg School of Management graduate. Firefly is an early stage company that started in May 2003 based on battery technology initially developed at Caterpillar.

Mr. Ovan discussed the curving path the business founders took to bring this technology out of the lab and transition it to a commercial battery product. He provided insights into business lessons learned, including the need to focus on the end goal of delivering a final product while simultaneously remaining flexible to changes and shifts in the marketplace.

Firefly’s first applied technology is a microcell foam-based battery technology that delivers a unique combination of high performance, low weight and low cost for a next-generation lead acid battery. Ovan’s primary message was that technology commercialization is not a straight path – external factors such as the quick rise and then fall of oil and gas prices and the swift decline of the economy can dramatically impact the decisions of potential customers. Early stage technology companies must vigilantly anticipate risks and shifts in customer attitudes toward new product adoption.

Throughout this coming academic year, CCITT will host a wide variety of speakers who will provide insights into starting a business, licensing a technology, financing product and company creation, creating value through consulting engagements, and adopting new technology from the perspective of a State Department of Transportation.



Mil Ovan, Senior Vice President and Co-founder of Firefly Energy Inc., speaks to attendees at CCITT's Technology Commercialization Speaker Series in November 2009.

CCITT

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CCITT is a USDOT-funded University Transportation Center operated within the Transportation Center in the McCormick School of Engineering at Northwestern University. CCITT 's mission is to foster the commercialization or implementation of innovative technologies for multiple modes of surface transportation including, but not limited to, railways, mass transit, highways and waterways. To accomplish this mission, CCITT awards funding to Northwestern faculty to conduct translational "innovation gap" research projects that push existing research outcomes closer to the point of adoption and implementation by public and private operators and users of all types in the transportation industry.

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