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UTC Spotlight

University Transportation Centers Program

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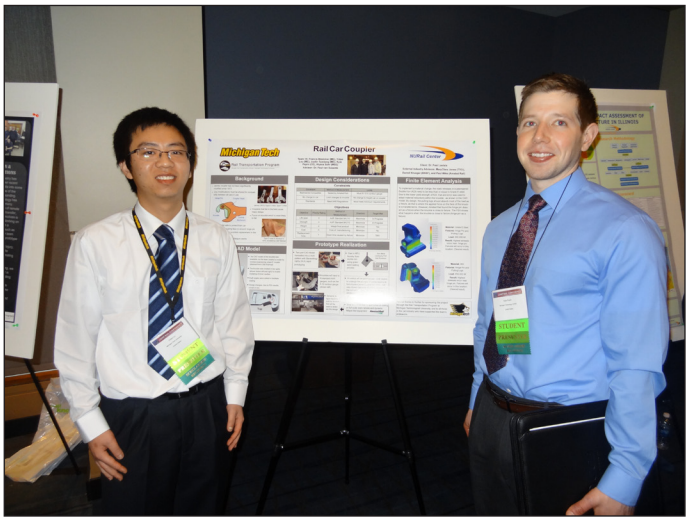
NURail—Developing a New Generation of Railway Professionals

Established by a grant issued in January 2012, the National University Rail Center (NURail) is the first USDOT-RITA Tier 1 University Transportation Center (UTC) dedicated to the advancement of North American rail transportation. NURail seeks to reverse the trend begun in the 1950s favoring air and highway transportation education over rail. This shift led to most engineering graduates in the latter part of the 20th century obtaining their degrees without any exposure to railways.

In its inaugural year, NURail concentrated efforts on promoting renewed faculty and student interest in railway engineering education and research. One of the main objectives for 2012 was to continue leading development of academic content for the Railway Engineering Education Symposium (REES), a collaborative effort with the American Railway Engineering and Maintenance of Way Association and other industry groups. REES provides a venue where professors can learn railway fundamentals and are provided with lecture materials on railway topics. The original 2008 event proved such a tremendous success that it was repeated in 2010 and again following the formation of NURail in 2012. A total of 90 professors have participated in the REES events and, based on follow-up surveys, numerous universities subsequently incorporated REES materials either into existing courses or developed new courses specializing in rail. Among NURail partners, eight new classes have been developed that focus on rail, for a total of 30.



NURail undergraduate students from Michigan Tech present a poster on their railway coupler design project at the Joint Rail Conference.

Graduate students at UIUC use the annual Engineering Open House to introduce rail and intermodal transportation concepts to elementary school students.

Another NURail objective is to reach beyond its seven member campuses by expanding online rail course content that can be shared with multiple institutions and establishing an extended group of "NURail Affiliate" colleges and universities.

In other educational initiatives, NURail has facilitated an increasing number of undergraduate student senior design projects on rail topics. Recent examples at Michigan Technological University (Michigan Tech) involved the design of railway couplers and sensor system for locomotive sand tanks, while students at the University of Illinois at Urbana-Champaign (UIUC) prepared a feasibility study and

Developing the next generation of railroad professionals is the central NURail educational goal. Mentoring NURail students proves to be a rewarding experience for the current generation of railroad engineering experts.

construction management plan for a future high-speed rail line between Chicago and Milwaukee. NURail's reach has also extended to K-12 activities in the form of a week-long Summer Youth Program in Rail and Intermodal Transportation at Michigan Tech and rail exhibits at the UIUC Engineering Open House.

Joint Rail Conference—Education, Workforce Development, and Technology Transfer in One Package

In addition to the classroom, NURail encourages experiential learning through internships, field visits, and industry conference attendance. The April 15–18, 2013 Joint Rail Conference (JRC), held in Knoxville, TN, provided a great opportunity to address the education, workforce development, and technology transfer components of the UTC mission at a single event. NURail's effort expanded beyond conference participation as it joined seven industry associations and organizations to cosponsor the conference. The conference organizing committee included several NURail faculty and staff, and the conference was Chaired by NURail co-PI, David Clarke, Ph.D., from the University of Tennessee, Knoxville.

Approximately 75 NURail researchers attended the conference, including over 50 undergraduate and graduate students sponsored by NURail and American Society of Mechanical Engineers (ASME) scholarships. NURail students attending the conference learned about the latest industry research and development activities while honing their presentation skills and obtaining feedback on NURail research and technology projects. As Alexander Lovett, from UIUC, described his experience, *"JRC is a great opportunity to meet and interact with fellow students from other NURail campuses while getting input on my research from a wide range of rail experts in academia and at the major railways that will ultimately implement our findings."* NURail leadership also used the conference to initiate the establishment of the NURail Student Leadership Council.

A highlight of JRC was two sessions dedicated to NURail student presentations. The first featured topics related to education such as formation of the AREMA Student Chapter at the Rose-Hulman Institute of Technology and development of a multimodal transportation course at the University of Kentucky. The second session concentrated on NURail research, including presentations on railroad infrastructure and rolling stock components, structures, and vehicle-track dynamics. Overall, NURail partners gave 43 technical presentations at the conference, including 3 in the plenary session.

Showcasing NURail at JRC is just one example of how NURail faculty and students stay on the leading edge of railway technology development while furthering the educational mission of the center to develop the next generation of railway professionals.

About This Project

Pasi Lautala, Ph.D., P.E., and Tyler Dick, P.E., are Associate Directors of Education for NURail. Dr. Lautala is an Assistant Professor and Director of the Rail Transportation Program at the Michigan Technological University and Tyler Dick is a Senior Research Engineer and Associate Director for Education in the Rail Transportation and Engineering Center (RailTEC) at the University of Illinois at Urbana-Champaign. Both Lautala and Dick have several years of engineering consulting experience for the rail industry and both are active members of the ASCE Rail Transportation Committee, AREMA Committee 24 – Education and Training and TRB Committees related to railways.