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University Transportation Center Newsletter

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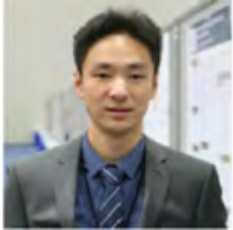
PacTrans hosts Delegation from Shenzhen China for Technology Workshop

This past July, PacTrans hosted a delegation led by Director Xiaochun Zhang, and included five other senior managers of the Shenzhen Urban Transport Planning Center. Shenzhen is directly adjacent to Hong Kong and is one of the most rapidly growing and advancing cities in China. They were here performing a six-day technology scan of the United States, very similar to the one that the Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials, and National Cooperative Highway Research Program sponsored in Europe in 2006. They seek technological solutions to their urban transportation challenges and want to establish collaborations with us as well.

Thus, PacTrans invited representatives from public agencies, private industry, and academic researchers to present their most innovative solutions. Groups represented included: IDAX, Inc., UW CoMotion, Verizon, City of Bellevue,



PacTrans Hosts Technology Transfer Showcase at WA ITE Annual Conference



Back in June, at this year's Annual Washington Institute of Transportation Engineers (ITE) Conference, PacTrans hosted a technology transfer showcase. Among the presenters was Ruimin Ke, PacTrans student researcher from the University of Washington. Mr. Ke presented a PacTrans research that is related to the transit bus collision avoidance technology that we have reported on in the past. The title of his presentation was specifically, *Testing Transit Bus Automated Collision Avoidance Warning Systems in Revenue Operations – Active Safety Collision Warning Pilot in Washington State*.



"The Rosco/Mobileye Shield+ system is a collision avoidance warning system (CAWS) specifically designed for transit buses operating under daylight conditions. The TRB IDEA project involved field testing and evaluation of the CAWS in revenue service over a three-month period. At the ITE Conference, I presented the University of Washington's work and result analysis of this project. The presentation included four parts: introduction to the Shield+ system, introduction to the project, system detection performance evaluation, and cost-benefit analysis. This presentation was part of a student session, and it generated interests of the industrial people."

Shenzhen continued

University of Washington, iSoftStone, NewSky Security, and Microsoft. Presenters had ten minutes to showcase their technologies, and then the audience had five minutes for questions. We heard a lot about big data and big data analytics, intelligent transportation systems, adaptive signal control, emerging detection methods and technologies, artificial intelligence, cyber security, and others.

During the workshop, PacTrans director, Yinhai Wang, and Shenzhen Urban Transport Planning Center director, Xiaochun Zhang, took an opportunity to sign a collaboration agreement that outline and expressly stated our mutual desire to continue building a strong partnership of collaboration into the future.

PacTrans Director Delivers TEDx Talk in Harbin, China

This past August, the Harbin No. 3 High School held a TEDx forum themed "Blooming." PacTrans director, Dr. Yinhai Wang, along with Australian psychologist, Shen Yi, and young US film director Chen Jianying, each presented at the forum. Dr. Wang spoke about intelligent transportation, big data, and what's to come with regard to the emergence of connected and autonomous vehicles. There were 300 in attendance and over 130,000 watched via live stream.

TED is a world-famous non-profit organization that invites innovators and practitioners at the forefront

of their industry to share their ideas in 18-minute speeches. Celebrities including David Cameron, Stephen Hawking and Bill Gates have spoken at TED events. TEDx, which is an

offshoot of TED, was created to allow communities around the world to organize and host their own events using the TED format.



WSU PacTrans PI Receives \$2.5M NSF Grant

A Washington State University researcher and PacTrans PI has received a \$2.5 million National Science Foundation grant to develop a statistical model that will help city managers make more informed sustainable water decisions. Xian-ming Shi, an Associate Professor in the Department of Civil and Environmental Engineering, will co-lead the four-year project in collaboration with Case Western Reserve University. The research team will develop an integrated model for decision support based on engineering, social, and economic factors. “Our society frequently faces the consequences of decisions made without considering their socio-economic context or the interdependency of the critical water infrastructure systems and services,” said Shi.

The recent Flint, Michigan water crisis is an example of these consequences, he said. Lead-contaminated

water caused a public health crisis and a federal state of emergency. The state decided to save money by switching Flint’s water source from Lake Huron to the Flint River, according to several media reports. The consequences of the switch and other actions were seen within a year. However, the consequences to decisions based on short-term cost considerations aren’t always immediately seen.

As part of the new grant, Shi will create a model that follows the migration pattern of deicers and their corrosive effects on iron pipes. Roadway deicers are chloride-based salts commonly used to prevent or undercut the formation of ice on roads. “Many of the deicers used don’t degrade in the environment. They just move from one place to another,” he said. “That can create a problem in the future. “Deicers

creep in the quiet. They don’t create dramatic action,” he added.

Shi is associate director of the Center for Environmentally Sustainable Transportation in Cold Climates, a Tier 1 UTC here in the Pacific Northwest, where he is conducting leading research in the areas of cold regions materials and sustainability and studying environmentally friendly alternatives for ice and snow control. The long-term effect that deicers can have on our drinking water and water infrastructure is poorly understood, said Shi: “We could be fine now, but our grandkids could be drinking contaminated water because of our misinformed “decisions.” Professor Bill Yu from Case Western Reserve University of Ohio co-leads the project. The NSF’s CRISP, or Critical Resilient Interdependent Infrastructure Systems and Processes program, is funding the grant.



RESEARCH HIGHLIGHTS



During the course of our MAP-21 funded safety center, PacTrans has funded a series of research projects involving the utilization of UAVs or drones by a team of researchers comprised of Joe Wartman (UW), Michael Olsen (OSU), and Keith Cunningham (UAF). They have used LIDAR and newly developed algorithm index called the Rockfall Activity Index (RAI), seeking to identify critical slopes that are dangerous to roadway infrastructure below, in a safe, reliable, and time/cost effective way.

Oregon Department of Transportation had begun implementing this new process in their critical slopes analysis. Since then, Alaska Department of Transportation has similarly begun to utilize these new methods and have been actively done control work to eliminate the danger of uncontrolled slides.

Further, Dr. Wartman, due to the large part of these projects, has opened his own National Science Foundation Center, the Post-Disaster Rapid Response Research Facility. They are exploring further utilization of the methods developed in the PacTrans funded work to allow us to better respond to natural disasters.

Also, this research has recently been back in the media. Earth Magazine's August issue features, among others, this safety-focused project titled, A Platform for Proactive Risk-based Slope Asset Management, led by Michael Olsen (OSU), Joe Wartman (UW), and Keith Cunningham (UAF).

STUDENTS

PacTrans Student Research Presents at IEEE CVPR Conference



This past July, PacTrans Student Researcher, Ruimin Ke (UW), traveled to Honolulu, Hawaii, to participate in the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Traffic Surveillance and Challenge Workshop. The IEEE CVPR Conference is among the most prominent conference focused on computing. Mr. Ke attended to present his research entitled, A Cost-Effective Framework for Automated Vehicle-Pedestrian Near-Miss Detection through Onboard Monocular Vision. This presentation is part of an ongoing effort between the University of Washington, PacTrans, and the Washington State Transit Insurance Pool, funded partially through a TRB IDEA grant, to test collision

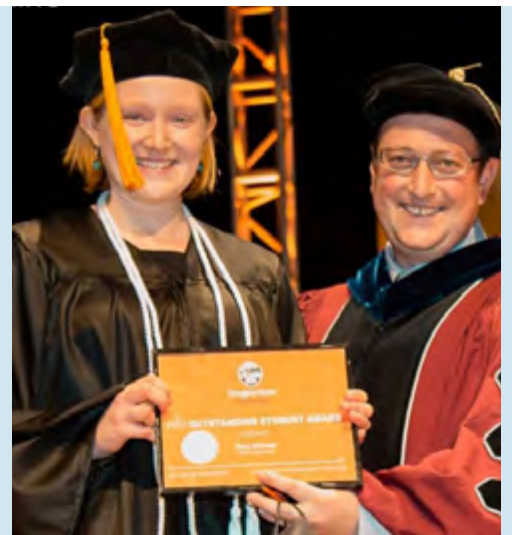
detection technology on transit buses in the Pacific Northwest.

“Pedestrian safety has generated broader concerns as the number of pedestrian-related fatalities keeps increasing in terms of the percentage to total fatalities. This is partly due to the lack of pedestrian data for conducting solid studies. Thus, near-miss, as a surrogate safety measure, has become popular in pedestrian safety. But extracting near-miss data from the huge amount of different resources requires efficient and automated methods. Computer vision techniques are powerful and able to take the information-rich traffic images and videos as input data. The study I presented at CVPR 2017 was about extracting vehicle-pedestrian near-misses from onboard monocular video data. This is among the first efforts to extract vehicle-pedestrian conflicts using onboard monocular vision. The framework we proposed is cost-effective. The experimental results showed that the proposed system is comparable to a commercial system with multiple camera sensors in terms of accuracy.”

“The talk I gave at the Hawaii Convention Center was 20 minutes. Looks like people were very interested in our work; they raised several good questions. There were many computer vision experts at the traffic surveillance and challenge workshop. I learned a lot from their talks and studies, especially on how the computer science people thought about transportation problems. Basically, they focused more on the detection methodology part and developed very cool detection algorithms, but most of their work could be improved by incorporating the key domain knowledge to explore more interesting and diverse transportation problems. I think if we, transportation people, could learn from these studies and combine their strength with ours, we would be able to produce very valuable research and solve some critical problems. Last but not least, I would like to express my appreciation for the opportunity and funding provided by PacTrans and the TRB IDEA project on the paper and this great trip!”

OSU PacTrans Fellow Wins 2017 CE Outstanding Student Award

Each year, the Oregon State University Civil Engineering department awards one graduate the CE Outstanding Student Award. This past academic year, the award was given to a PacTrans Fellow, Amy Wyman. Ms. Wyman was not only a scholar, but an English tutor, as well as a DJ. She conducted UHC research on traffic signal countdown timers and the visual attention of drivers as well as tsunami evacuation modeling of seaside communities using the OSU driving and bicycling simulator. Additionally, she hosted a weekly radio show of new music on KBVR 88.7 fm Corvallis. Ms. Wyman was presented the award by Dr. Hurwitz, her UHC advisor, during the CE Graduation Celebration in June. Congratulations Amy!



STUDENTS

University of Washington Student Among Winners in ARTBA Student Video Contest



Congratulations to all winners of this year's student video contest!

To view all winning entries, please [click here](#).

ARTBA's Research and Education Division (RED) has successfully completed the 7th year of its Student Video Contest Promoting Importance of U.S. Transportation Infrastructure. The annual contest encourages students to connect with current trends in American transportation infrastructure, focusing on topics of general transportation and safety. ARTBA awards national recognition and cash prizes to students who submit the most creative, informative, and

engaging short video. The contest is open to students in both K-12 and post-secondary education, allowing several students from CUTC-affiliated universities to win big in this year's contest.

Four students from CUTC-affiliated universities have won top prizes in this year's contest. Among them was University of Washington student Daniel Shen who won 1st place in the RED General Transportation category. His video, "[The Gas Tax](#),"

describes the low-cost, high-reward nature of the gas tax in his video, closely examining the tax's overall effects on both consumers and federal infrastructure. Daniel is a senior at the University of Washington working to complete a degree in business administration.

This is the second year in a row that a Seattle submission took home a gold, last year was from a [local high school student](#).

OSU 2017 Summer Undergraduate Research Fellowship Program

PacTrans has a steadfast devotion to the education and cultivation of the next generation of transportation professionals. We do this by offering fellowships and financial support, sending students to prominent conferences to listen to or present work, we sponsor student competitions and student chapters of professional organizations, we host seminars and workshops, and we recognize excellence with the annual Michael Kyte Outstanding Student of the Year Award.

One unique way that our consortium partner Oregon State University supports students is through their Summer Undergraduate Research Fellowship (SURF) Program. This year, the program awarded upwards of twenty fellowships (up from eleven last year) to support hands-on research. This year's focus is on "Engineering Solutions for Resilience, Safety, and Infrastructure Renewal." During the eight-week program, students participate in a specific project related to one of those three focus areas, learned about the engineering that goes into such work, and develops research skills to increase graduate school opportunities.

Each student is equipped with a \$4,500 stipend, and a research project with a faculty mentor, and has the opportunity to participate in field trips for site-specific field work, weekly seminars from noted speakers, and informal lunch meetings to discuss graduate school. At the culmination of the program, the students will present at a final symposium to highlight their work. The date for that symposium is August 11, 2017. For more information about the program and the project list for this summer, click [here](#).

This year, PacTrans is directly supporting the program by matching support for Scott Logan-Deeter's appointment in the OSU Driving and Bicycling Simulator. We are very excited to be involved in such a great summer opportunity that both furthers students' education and challenges them to go on to higher education.



PacTrans Consortium Partner UI Hosts Second Annual Michael Kyte Distinguished Lecture

This past September, PacTrans consortium member University of Idaho, hosted the second annual Michael Kyte Distinguished Lecture, which brought to the U of I Moscow campus Peter Koonce, P.E., Division Manager, Signals and Street Lighting, and ITS Division at the City of Portland.

Peter Koonce, P.E., has been described as one of the most progressive transportation engineers in the United States, dedicating his life to innovative treatments that improve the safety of multimodal travel. He manages the City of Portland Bureau of Transportation's Signals, Street Lighting, and ITS Division and is responsible for the oversight of an annual budget in excess of \$13 Million and 43 professionals. He has served as an adjunct professor at Portland State University teaching graduate level courses in transportation engineering. He is a member of the Bicycle Technical Committee of the National committee on Uniform Traffic Control Devices and was appointed Chair of the Transportation Research Board's Committee on Traffic Signal Systems, and many other accolades. The Michael Kyte Distinguished Lecture is an annual transportation lecture hosted in honor of former UI Professor Michael Kyte, whom, after a long and distinguished career serving as an educator in the Pacific Northwest, retired several years ago.



OUTREACH TECHNOLOGY TRANSFER AND PARTNERSHIPS

PacTrans hosts Delegations from Taiwan for Technology Symposium

This past September, PacTrans hosted a delegation including senior engineer Ms. Chueh-Ting Chen and deputy director Mr. Zhenqi Wu from Taiwan Ministry of Transportation and Communications for a technology symposium. They were here seeking technological solutions to their intelligent transportation systems (ITS) development challenges and want to establish collaborations with us as well.

During the symposium, PacTrans director, Yin Hai Wang, presented an introduction of PacTrans and related research to the delegation. Ms. Chueh-Ting Chen introduced the ITS technology development and challenges in Taiwan. We also invited PacTrans PIs, Co-PIs and their research team to present their most innovative solutions. Dr. Joseph Wartman, Associate Professor at University of Washington, gave an excellent presentation about unmanned aircraft system assessments of landslide safety for transportation corridors. We also heard a lot about improving freeway traffic safety and efficiency, enhancing safe traffic operations using connected vehicles data and technologies, and digital roadway interactive visualization and evaluation network.



PacTrans Hosts the Consul General of the People's Republic of China



On Thursday, September 14th, PacTrans hosted Ambassador Linquan Luo, Consul General of Consulate-General of the People's Republic of China. He traveled from San Francisco to spend a day in the STAR Lab where director, Yin Hai Wang and his student researchers, introduced research in the big data platform, traffic sensing, and intelligent traffic control. Mr. Luo also shared ideas about challenges and opportunities in improving mobility in the transportation system.



PacTrans Discusses Partnerships with PACCAR

This past July, PacTrans' director, Yin Hai Wang, and assistant director, Cole Kopca, met with folks from Paccar about potential opportunities in collaboration. Paccar, among the largest manufacturers of medium- and heavy-duty trucks in the world, is the parent company for Kenworth Trucks, Peterbilt Motors, and others. They are a forward thinking company currently looking to identify emerging trucking industry and logistics trends, and begin innovating products to not only better support those trends but also further their commitment to sustainability.

Dr. Wang introduced them to PacTrans and many of the great technology and data solutions that have, and are currently being developed in his STAR Lab. Then Mr. Kopca spent some time describing the breadth of expertise that PacTrans PIs can offer as a whole. Both parties were optimistic that strong future partnership will be mutually beneficial and each is currently in the process for more definitively articulating specific areas where they see immediate collaboration.

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Adjunct Professor, Electrical Engineering
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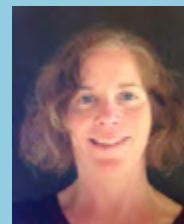
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Idaho Transportation Department

SAVE THE DATE

PacTrans Regional Transportation Seminar

Wednesday, January 24, 2018

– featuring Dr. David Noyce from the University of Wisconsin

Regional Transportation Conference

Friday, October 12, 2018 in Fairbanks, Alaska

About Pacific NW Transportation Consortium

The Pacific Northwest Transportation Consortium (PacTrans) is the Region 10 University Transportation Center (UTC) established in January 2012 with funding from the US Department of Transportation (USDOT).

PacTrans is a combined effort of transportation professionals and educators from the University of Washington (UW), Oregon State University (OSU), the University of Alaska Fairbanks (UAF), the University of Idaho (UI), Washington State University (WSU), Boise State University (BSU), and Gonzaga University (GU). With two active centers focusing on both Safety and Mobility, PacTrans serves as an engine and showcase for research, education, and workforce development in the Pacific Northwest.

The goal of PacTrans is to create an environment where consortium universities and transportation agencies within Region 10 work

together synergistically. The PacTrans program focuses on the USDOT-identified priority of Improving the Mobility of People and Goods. This priority includes the following nonexclusive topic areas:

- Increase access to opportunities that promote equity in connecting regions and communities, including urban and rural communities;
- Smart cities;
- Innovations to improve multi-modal connections, system integration, and security;
- Assistive technologies for those with physical or cognitive disabilities;
- Data modeling and analytical tools to optimize passenger and freight movements;
- Innovations in multi-modal planning and modeling for highgrowth regions;

- Novel (non-traditional or alternative) modes of transport and shared use of infrastructure; and
- Regional planning and setting of transportation priorities.

The Pacific Northwest offers a unique blend of opportunities to examine a variety of transportation issues, including those related to urban centers, rural communities, diverse geographic features (e.g., coastal plains, mountain ranges), and a growing population of pedestrians and bicyclists. This diversity makes the Pacific Northwest a natural laboratory in which to investigate transportation solutions that are applicable both locally and nationally.

PacTrans is dedicated to collaborating with transportation agencies, companies, and research institutions to jointly develop safe and sustainable solutions for the diverse transportation needs of the Pacific Northwest.

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