



**Northwestern University
Transportation Center**

CCITT

Center for the Commercialization of
Innovative Transportation Technology

Industry Technical Workshop

MACHINE LEARNING IN TRANSPORTATION

OCT. 26, 2016 | 2:00 - 5:00 PM

NORRIS UNIVERSITY CENTER - 1999 CAMPUS DRIVE, EVANSTON

Industry Technical Workshop

FALL 2016

MACHINE LEARNING IN TRANSPORTATION

The **Fall 2016 Industry Technical Workshop: *Machine Learning in Transportation*** is co-hosted by the Northwestern University Transportation Center (NUTC) and the Center for the Commercialization of Innovative Transportation Technology (CCITT). In two panel sessions, industry and University experts will present case studies of: (1) applications of machine learning in personal (consumer) travel, and (2) applications of machine learning in commercial aviation and freight transportation. Following the presentations, the speakers will participate in moderated panel discussions about the impacts, opportunities, challenges and benefits of integrating machine learning techniques with transportation operations and applications.

EVENT CO-CHAIRS

Dr. Hani S. Mahmassani

William A. Patterson Distinguished Professor of Transportation & Director, *NUTC*

Mr. Breton Johnson

Associate Director, *NUTC* & Director, *CCITT*

ABOUT NUTC

The Northwestern University Transportation Center (NUTC) is one of the world's leading interdisciplinary education and research institutions, serving industry, government and the public sectors. Founded in 1954 to generate substantive and enduring contributions for the better movement of materials, people, energy, and information, NUTC stands at the forefront of transportation research and education. NUTC brings together academic researchers, students and business affiliates in a joint open exploration of transportation and supply chain operations. NUTC aims to influence national and international transportation policy, management and technological developments, with the goal of making transportation and supply chain operations more productive, efficient, safe, secure, environmentally friendly and socially beneficial.

ABOUT CCITT

The Center for the Commercialization of Innovative Transportation Technology (CCITT) fosters the implementation of innovative technologies for all modes of surface transportation, including but not limited to railways, mass transit, highways and waterways.

Workshop Agenda

WEDNESDAY, OCTOBER 26, 2016

2:00 - 2:05 PM WELCOME

Mr. Bret Johnson > Director, CCITT & Associate Director, NUTC

2:05 - 3:30 PM **PANEL 1: PERSONAL TRAVEL**

Machine Learning for Traffic Event Detection

Dr. Aggelos Katsaggelos > Joseph Cummings Professor of Electrical Engineering & Computer Science, *Northwestern University*

The Ultimate Smart Driving Machine: Powering the Connected Car with Machine Learning

Dr. Alvin Chin > Senior Researcher, *BMW Technology Corporation*

Real-Time Machine Learning for Car Insurance Applications Using Telematics Data

Mr. Mo Patel > Practice Director, Artificial Intelligence & Machine Learning, *Teradata*

MODERATOR

Mr. Tony Belkin > Head of Traffic & Dynamic Content, *HERE*

3:30 - 3:45 PM NETWORKING BREAK

3:45 - 5:00 PM **PANEL 2: AIR & FREIGHT TRANSPORTATION**

Cognitive Computing in Transportation. Use of Augmented Intelligence in Maintenance.

Mr. Keith Dierkx > Global Travel & Transportation Rail Leader, *IBM*

On Track to Improved Reliability: From Rules to Predictions

Mr. Joe Becker > Field Services Manager, *Uptake*

Machine Learning Opportunities in Freight Transportation Operations

Mr. Ted Gifford > Distinguished Member of Technical Staff, *Schneider*

MODERATOR

Mr. Frank Bush > Senior Consultant, *Teradata*

Speaker Biographies

JOE BECKER

Field Services Manager, Uptake

Joe Becker: Director, Rail at Uptake, a predictive analytics software company that captures new value for enterprise companies by connecting and analyzing massive amounts of untapped data. Joe holds a BS in mechanical engineering; his background is in design, manufacturing, project and account management, and sales. In his current role, Becker manages the relationship between industry partners and Uptake, prioritizes deliverables, and works in partnership to develop new business opportunities.

ALVIN CHIN

Senior Researcher, BMW Technology Corporation

Dr. Alvin Chin is a Senior Researcher in machine learning at BMW Technology Corporation in Chicago. His research interests include the connected car, mobile social networking, ubiquitous computing, big data, and machine learning. Dr. Chin has authored more than 30 publications and 10 patents, including pending. He received a PhD in Computer Science from the University of Toronto. Contact him at alvin.chin@bmwna.com or visit his website at <http://www.alvinchin.com>.

KEITH DIERKX

Global Industry Leader, Rail; Director, IBM Global Rail Innovation Center, IBM

Keith Dierkx leads a global team of rail subject matter experts, researchers and developers focused on leveraging IBM innovation to help transform client's businesses. He is currently working globally with clients on "game-changing" solutions to key challenges—cloud, analytics, mobile and social business. Dierkx was previously Senior Vice President of Operations for a subsidiary of Marine Terminal Corporation (now PortsAmerica) and Vice President at Savi Technology, now part of Lockheed Martin. He received his BA from the University of California, Berkeley and his MBA from Duke University.

TED L. GIFFORD

Distinguished Member Of Technical Staff, Schneider

Ted Gifford is a Distinguished Member of Technical Staff at Schneider National. His technical responsibilities include lead design of models/algorithms for various problems in logistics, transportation networks, revenue management, supply chain design, and capacity planning. He is also engaged in statistical analysis, data mining, and simulation in areas such as operations productivity, safety cost reduction, and vehicle maintenance. His management responsibilities include

overseeing strategic partnerships with external research and development groups. In his most recent prior position, Gifford served as Vice President of Engineering & Research, where he led an organization comprised of groups engaged in supply-chain and transportation engineering, industrial engineering, statistical analysis, operations research modeling, business consulting, and development of decision support software tools. He currently serves on the Scientific Advisory Board for McKinley Capital Management, Customer Advisory Boards for Oracle and IBM, and the Industry Advisory Board for the Center for Supply Chain Management at Marquette University. Prior to joining Schneider, Gifford was Director of Quantitative Research at McKinley Capital Management. His previous positions include Associate Professor of Mathematical Sciences at the University of Alaska-Anchorage; Senior Engineering Manager at Symantec Corporation, and President of Computer Consultants of Alaska.

AGGELOS KATSAGGELOS

Joseph Cummings Professor of Electrical Engineering & Computer Science Northwestern University

Aggelos K. Katsaggelos received the Diploma degree in electrical and mechanical engineering from the Aristotelian University of Thessaloniki, Greece, in 1979, and the M.S. and Ph.D. degrees in Electrical Engineering from the Georgia Institute of Technology, in 1981 and 1985, respectively. In 1985, he joined the Department of Electrical Engineering and Computer Science at Northwestern University, where he is currently a Professor holder of the Joseph Cummings chair. He was previously the holder of the Ameritech Chair of Information Technology and the AT&T chair. He is also a member of the Academic Staff, NorthShore University Health System, an affiliated faculty at the Department of Linguistics and he has an appointment with the Argonne National Laboratory.

He has published extensively in the areas of multimedia signal processing and communications (over 230 journal papers, 500 conference papers and 40 book chapters) and he is the holder of 25 international patents. He is the co-author of *Rate-Distortion Based Video Compression* (Kluwer, 1997), *Super-Resolution for Images and Video* (Claypool, 2007), *Joint Source-Channel Video Transmission* (Claypool, 2007), and *Machine Learning Refined* (Cambridge University Press, 2016). He has supervised 54 Ph.D. theses so far.

MO PATEL

Practice Director, Artificial Intelligence & Machine Learning, Teradata

Mo Patel, based in Austin Texas, is a practicing Data Scientist at Teradata. In his role as the Practice Director, Mr. Patel is focused on building the Machine Learning & Artificial Intelligence consulting practice via mentoring and advising Teradata clients. Mo Patel has successfully completed Advanced Analytics projects with clients across several industries, notably Major Cable Company, Major Auto Manufacturer, Major Medical Devices Manufacturer, Leading Technology Firm and Major Car Insurance Provider.

In the area of Machine Learning, Mr. Patel conducts research on applications of Deep Learning, Reinforcement Learning, and Graph Analytics towards solving existing and novel business problems. Mo loves to share his thoughts on latest developments in advanced analytics via his blog at <https://medium.com/@mopatel> and his twitter account @mopatel.

TONY BELKIN [Moderator]

Head of Traffic & Dynamic Content, *HERE*

Tony Belkin is responsible for traffic, dynamic content and mobility analytics at HERE. He has been using Big Data and massive parallel processing algorithms to integrate with connected cars and deliver traffic estimations and predictions, road optimization, traffic light predictions, traveler safety warnings, dangerous driving conditions and vehicle behavior analytics products for Automotive OEMs, Enterprises, Governments and Consumers. With over 30 years of product development experience and over 25 US Patents, Tony serves on the advisory board of Northwestern University Masters in Engineering Management and NUvation Transportation Course.

Tony holds degrees in Electrical Engineering from the University of Illinois at Chicago and Illinois Institute of Technology, MBA from the Northwestern University Kellogg School of Management.

FRANK BUSH [Moderator]

Senior Consultant, *Teradata*

Frank Bush joined Teradata in 2007 as Senior Travel Industry Consultant. Frank has over 20 years of experience in the airline, travel, travel distribution and technology industries. Following graduate school, Frank worked for American Airlines in a variety of roles, including Revenue Management and Pricing Strategy, Marketing Planning and Corporate Finance. Frank then joined Sabre Inc., working in Operations Planning, Finance, Corporate Strategic Planning and Data Services roles.

Frank is a frequent speaker at a variety of industry events, including PhoCusWright and Teradata's annual Partners Conference on topics including: AA's Governance program development, Delta's development of the PNR Warehouse, Airline Merchandising and Customer decision making, Next Generation Dash Boards, linking strategy to analytics, Omni Channel for Travel and Transportation

Frank earned his MBA in Finance and Statistics from University of Chicago, Booth School of Business and his Bachelor of Arts in Economics / Econometrics from University of California, San Diego.



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