2017 Problem Competition

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The 2017 Problem Description: Data Analytics for Railroad Empty-to-Load Peak Kips Prediction

This project asked participants to build a predictive model which can be used to project the peak kips of a currently empty car when it is used under the next loaded status. This implies that the projection will be calculated when the car is empty. This model will help the railroad company exclude the problematic wheels/cars from the next trip.

Peak kips denotes the total vertical force a wheel imposes on the rail. A "kip" is a unit of force that is equal to 1,000 pounds-force, and it can be measured by track-side detectors. The higher the peak kips, the more damage will be imposed to both the wheels and tracks. Railroads use this measure to detect whether there are any defects in either the tracks or the wheels. An alarm will be triggered if the peak kips value is above or equal to 90, and the involved cars need to be set out for inspection and repair (if necessary) either immediately or at the next available repair location. Although immediate action is not required for wheels with peak kips values close to 90, the damage to tracks and wheels might deteriorate (and the peak kips of a defective wheel may further increase) if the defective wheels are not fixed in time. However, setting out a car when it is loaded will cause a lot of loss to railroad company. The shipment might get delayed and the network traffic might suffer from unnecessary disruptions. Therefore, the railroad has an incentive to proactively identify problematic wheels/cars and exclude them from being used for future shipments.

The cash prizes awarded for this year's competition are **First Place: $2000** and **Second Place: $1,000.** Visit the competition web site for additional details: http://connect.informs.org/railway-applications/awards/problem-solving-competition

Special thanks to Oliver Wyman for sponsoring the first place prize!

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Finalists (in alphabetical order)

***Team OALLIIM*:**

Tai-Chia Huang, Shiue-Mei Sun, Yun-Hsuan Lu, Department of Industrial & Information Management, National Cheng Kung University, Taiwan

Team TCS:

Harshad Khadilkar, Sudhir Kumar Sinha, Shripad Salsingikar, Tata Consultancy Services, Mumbai, India

Recognition

We thank the committee members for their efforts:

Clark Cheng, Norfolk Southern
Jerry Kam, CSX
Steven Tyber, GE Transportation
Shanshan Wang, BNSF
Pooja Dewan, BNSF
Xiaopeng Li, University of South Florida
Yanfeng Ouyang, University of Illinois at Urbana-Champaign
Aihong Wen, CSX