**Optimizing Truck Dispatching Decisions in Open-pit Mining using Integer Programming**

A key operational problem in open-pit mining is the real-time dispatching of trucks between mining locations (where ore is loaded at trucks) and processing and waste ore sites (where ore is dumped). The goals in dispatching are consistently supply the processing sites with enough ore, to maintain ore quality at the processing sites (by mixing ore from different mining locations), and to meet extraction targets at the mining sites. The problem is challenging due to the potentially conflict between these goals and the need to make the dispatching decisions in real-time, in an environment with significant randomness in travel, loading, and unloading times, and in ore quality. We propose an optimization-driven approach to making dispatching decisions with a mixed-integer programming (MIP) model. We conduct a simulation study to compare the approach to two simpler policies that mimic industry practice, and find that the MIP-based dispatching approach significantly outperforms the competing policies on a wide variety of test cases, with the differences being most stark when the number of trucks is limited.

**Bio: Dr. Jim Luedtke** is an Associate Professor in the department of Industrial and Systems Engineering at the University of Wisconsin-Madison. Luedtke earned his Ph.D. at Georgia Tech and did postdoctoral work at the IBM T.J. Watson Research Center. Luedtke’s research is focused on methods for solving stochastic and mixed-integer optimization problems, as well as applications of such models. Luedtke is a recipient of an NSF CAREER award, was a finalist in the INFORMS JFIG Best Paper competition, and was awarded the INFORMS Optimization Society Prize for Young Researchers. Luedtke serves on the editorial boards of the journals SIAM Journal on Optimization, INFORMS Journal on Computing, and Mathematical Programming Computation. Luedtke is the current secretary of the SIAM Activity Group in Optimization, serves on the Committee on Stochastic Programming, and is a former secretary/treasurer of the INFORMS Optimization Society.