

Risk Clinic: Stochasticising a Train Control Model

Hongbo Ye
School of Engineering

12:30 pm, Tuesday, 21 May 2019
Risk Institute Seminar Room
Institute for Risk and Uncertainty
Chadwick Building, University of Liverpool

Abstract: Transportation engineers have created a Matlab code for controlling the movement of a train along its scheduled route for optimum efficiency, but their model is deterministic with no accounting for the stochastic variation in the passenger load or local weather conditions that influence performance. This thinkover will explore how we can edit the model within Matlab to take account of these stochastic factors to test and evaluate the movement controller in a more realistic setting.

Lunch will be provided. Please register at <https://forms.gle/xvJuEV7SqU6JUbQX8>.

Files (available at <https://sites.google.com/site/riskthinkover/home/yetraincontrol>)

- metro.m : simple deterministic model without braking
- metro.slx : early implementation in Simulink
- metro0.m : version that made the graphs on the slides
- train.m : deterministic model with braking
- data.mat : lookup table data needed by train.m
- slowtrain.m : just the same as train.m but with animation

Speaker Hongbo Ye is a new lecturer in Civil Engineering at the University of Liverpool. He holds a PhD from The Hong Kong University of Science and Technology and a BEng in Automation from University of Science and Technology of China. He was also a research fellow in the Institute for Transport Studies at University of Leeds. He has worked in projects funded by RSSB, Newton Fund, Horizon 2020 and Innovate UK. His research improves transportation system efficiency and sustainability to benefit both travellers and the operators.

Thinkovers are short but intensive sessions at which a presenter poses a problem to students and staff at the [Institute for Risk and Uncertainty](https://sites.google.com/site/riskthinkover/) who think over the problem and collectively work on a solution interactively with the presenter. Thinkovers are commonly held with catering at the Institute's Seminar Room in the Chadwick Building at the [University of Liverpool](https://sites.google.com/site/riskthinkover/) ([directions](#)). They are usually scheduled for two-hour blocks, with the initial presentation in the first half hour. We use [Slack](#) to facilitate interactions during and after the thinkover. Our solutions are published on [Github](#). See upcoming thinkovers at <https://sites.google.com/site/riskthinkover/>.