## LIU, Shi Qiang

BEng BA MEng HIT, MEng NUS

**Thesis Title:** 

Modelling and Solving Train Scheduling Problems under Capacity Constraints **Supervisors:** 

Professor Erhan Kozan (Principal)

Professor Vo Anh (Associate)

## Citation:

Sam's PhD research aimed to achieve a significant efficiency improvement in a coal rail network on the basis of the development of standard modelling approaches and generic solution techniques. He proposed many innovative algorithms for several new types of scheduling problems originated in this research. One of them called the *SLEK algorithm*, which incorporates the *feasibility-satisfaction procedure*, *train-insertion*, *tune-up procedure* and *conflict-resolve* sub-algorithms, is proposed to construct the feasible train timetable by satisfying the blocking, no-wait, deadlock-free and conflict-free constraints. Extensive computational experiments show that the proposed methodology can achieve a significant efficiency improvement in operating a complex rail network and can be applied as a toolbox of standard and fundamental tools for analysing, modelling and solving real-world scheduling problems.