



Statistical Sciences
UNIVERSITY OF TORONTO

SEMINAR

February 9, 2017 at 3:30 pm

Refreshments will be provided at 3:15pm

Sidney Smith Hall, Room 2108

Speaker: Ryan Donnelly, École polytechnique fédérale de
Lausanne

Host: Sheldon Lin

Optimal Decisions in a Time Priority Queue

It will be shown how the position of a limit order in the queue influences the decision of whether to cancel the order or let it rest. Using data from the Nasdaq exchange, an empirical analysis is performed on various limit order book events. Based on the empirical findings a queuing model is developed that captures stylized facts of the data. This model includes a distinct feature which allows for a potentially random effect due to the agent's impulse control.

The queuing model is applied in an algorithmic trading setting by considering an agent maximizing her expected utility through placing and cancelling of limit orders. The agent's optimal strategy is presented and then its performance analyzed in a simulation study. The study shows that the strategy improves when compared to one which ignores the effect of position. This extra gain stems from posting a limit order during adverse conditions and obtaining a good queue position before conditions become favourable.