Hamilton Institute

ROMA: Random Overlook Mastering ATFM

Carlo Lancia
Universita' di Roma Tor Vergata & TU/e

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Abstract

Consider the arrival process defined by $t_i = i + \xi_i$, where ξ_i are i.i.d random variables. First introduced in the 50's, this arrival process is of remarkable importance in Air Traffic Flow Management and other transportation systems, where scheduled arrivals are intrinsically subject to random variations; other frameworks where this model has proved to be capable of a good description of actual job arrivals include health care and crane handling systems. This talk is ideally divided in two parts.

In the first half, I will show through numerical simulations two of the most important features of the model, namely, the insensitivity with respect to the nature (i.e. the law) of the delays ξ_i and the extremely valuable goodness of fit of simulated queue length distribution against the empirical distribution obtained from actual arrivals at London Heathrow airport. Further, I will show that the congestion related to this process is very different from the congestion of a Poisson process. This is due to the negative autocorrelation of the process.

In the second part, I will restrict the analysis to the case where the delays ξ_i are exponentially distributed. In this context, I will show some preliminary results on a possible strategy to find the stationary distribution of the queue length using a bivariate generating function.

Venue: Seminar Room, Hamilton Institute, Science Building, NUI Maynooth

Time: 2.00 - 3.00pm

Travel directions are available at www.hamilton.ie

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