Hamilton Institute

Control, Systems Biology & Communication Networks

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Abstract: This talk will be split in two diverse halves.

In the first half I describe joint work with Peter Wellstead and others on some observations from control theory on interventions in biomedical regulatory loops. It turns out that under some assumptions about the nature and topology of biomedical feedback loops, disease, and medical interventions, there are classes of systems that fail to satisfy what in systems theory is known as stabilisability. In the systems considered, this inevitably leads to some potentially undesirable long term drift behaviours in the response. This situation, together with additional complexities for multivariable interactions, and possible alternatives.

In the second half of the talk I will describe some work with Chris Kellett, Bob Shorten and others in multiple bottleneck AIMD flows. This work builds on past results on single bottleneck AIMD flows, where the group at the Hamilton have been able to show a range of fairness results. We extend consideration here to multiple bottlenecks, where the flow behaviours are much more complex, and even in the deterministic case, may not have a unique fixed point. In particular, we look at some specific analytical results that may be loosely described as a form of average fairness amongst parallel flows in multiple bottleneck AIMD flows.

Venue: Seminar Room, Hamilton Institute, Rye Hall, NUI Maynooth

Time: 1.00 - 2.00pm (followed by tea/coffee)

Travel directions are available at www.hamilton.ie

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