



UNIVERSITY  
OF ALBERTA

# CPA Speaker Series - Business Analytics

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10:00 AM - 11:30 AM

Location: BUS 4-06

## Asymmetries of Service: Interdependence and Synchronicity

### ABSTRACT

On many dimensions, services can be seen to exist along spectra measuring the degree of interaction between customer and agent. For instance, every interaction features some number of contributions by each of the two sides, creating a spectrum of interdependence. Additionally, each interaction is further characterized by the pacing of these contributions, implying a spectrum of synchronicity. Where a service falls on such spectra can simply be a consequence of its design, but it can also be a function of its state. As broadly evidenced empirically, an agent with several concurrent interactions will be slowed in each individual interaction, altering the service's synchronicity. Here, we study a Hawkes cluster model of the customer-agent interaction, which we show captures both of these service (a)symmetries. We find insightful connections to behavioral operations, such as proving the occurrence of non-monotonic performance (e.g., inverted-U throughput) from concurrency-driven asynchrony. Hence, we can prescribe the agent's optimal concurrency level. Furthermore, we show how the service design dictates the efficacy of these operational improvements, proving that the concurrency-optimized throughput is itself non-monotonic as a function of the interdependence. In what may be of independent interest methodologically, we establish an interpretable decomposition for Hawkes clusters via probabilistic combinatorics.