

The Hong Kong University of Science and Technology

Dept of Information Systems, Business Statistics
and Operations Management
Dept of Industrial Engineering & Decision Analytics
Joint Seminar Announcement



Data-driven Consumer Debt Collection via Machine Learning

by

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Date : **6 September 2019 (Friday)**
Time : **11:00 am - 12:15 pm**
Venue : **Room 1001, LSK Business Building**



Abstract: This paper develops and tests a data-driven framework for the scheduling of outbound calls made by debt collectors. We determine on a daily basis which debtors should be called to maximize the amount of debt recovered in the long term, under the constraint that only a limited number of phone calls can be made each day. Our approach is inspired by Markov decision processes, but given the intractability arising from having an extensive state space, we approximate the value function based on detailed historical data through the use of machine learning. Specifically, we predict the likelihood with which a debtor in a particular state is going to settle his debt and use this as a proxy for the value function. Based on this approximation, we compute for each debtor the marginal value of making a call, and prescribe phone calls by prioritizing debtors in states that have the highest marginal value. This approach is flexible, and is able to exploit all information available in the data regardless of complexity. We validate our methodology using a controlled field experiment conducted with 921 real debtors in partnership with a mid-sized debt collection agency. The results show that our data-driven policy substantially outperforms the incumbent calling policy that has been used in business practice for many years—collecting more debt while using substantially fewer resources. To conclude, the performance uplift from the experiment suggests that our framework is able to learn from the data and improve calling decisions.

Bio: Dr Qingchen Wang is an assistant professor in the Innovation and Information group at the Faculty of Business and Economics of The University of Hong Kong. Qingchen's research focuses on the development and application of machine learning and artificial intelligence techniques for solving real-life business problems. Qingchen is also a seasoned practitioner of machine learning and predictive analytics, having consulted on a number of industry projects and won multiple international competitions.

All interested are welcome!
Enquiries: Dept of ISOM