

THE HONG KONG POLYTECHNIC UNIVERSITY DEPARTMENT OF MANAGEMENT AND MARKETING

Departmental Research Seminar



A Heuristic Approach to Explore: The Value of Perfect Information By

Prof. Andrew Ching
Johns Hopkins University

Date : 14 Oct 2019 (MON)
Time : 2:30 pm – 4:00 pm
Venue : M802

Abstract

How do people make choices in a dynamic stochastic environment when they face uncertainty about the return of their choices? The classical approach to this problem is to assume consumers use dynamic programming to obtain the optimal decision rule. However, this approach has two drawbacks. First, it is computationally very expensive to implement in practice because it requires solving a dynamic programming problem with a continuous state space. Second, it assumes decision-makers have unbounded cognitive ability to optimally process and use information. To address these two issues, we propose a new heuristic decision process called the Value of Perfect Information (VPI), which extends the idea first proposed by Howard (1966) in the engineering literature. This approach provides an intuitive and computationally tractable way to capture the value of exploring uncertain alternatives. In VPI, a decision-maker investigates the benefits of a subset of information, which can improve her myopic decision outcome. We argue that our VPI approach provides a "fast and frugal" way to balance the trade-off between exploration and exploitation. More specifically, the VPI approach only involves ranking the alternatives and computing a one-dimensional integration to obtain the expected future value of exploration. In terms of computational costs, we show that the VPI approach is significantly simpler than the standard dynamic programming approach, making it a much more practical model for people to employ. Using individual-level scanner data, we find evidence that our VPI approach is able to effectively capture consumers' choices.

Prof. Andrew Ching is a Professor in the Carey Business School at the Johns Hopkins University, where he is cross-appointed to the Department of Economics and the Bloomberg School of Public Health. He is currently serving as an Associate Editor for *Management Science*, and a member of editorial boards for *Marketing Science* and *Journal of Marketing Research*. His research focuses on developing new empirical structural models and estimation methods to understand the forward-looking, strategic, learning and bounded rational behavior of consumers and firms. He has applied these methods to several industries including prescription drugs, nursing homes, payment methods, retail banking, peer-to-peer lending, video game, etc. He has published in *Econometrica*, *Management Science*, *Marketing Science*, *Journal of Banking and Finance*, *Journal of Applied Econometrics*, etc.. He has received Young Economist Award from European Economic Association, Honorable Mention of Dick Wittink Prize Award, and several major research grants from Social Sciences and Humanities Research Council in Canada.

All interested are welcome.



THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

Department of
**MANAGEMENT
& MARKETING**
管理及市場學系