

POSTGRADUATE PROGRAM APPLICATIONS: Simultaneous Search, Sequential Outcomes, and Reservation Fees



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SEK210, Simon & Eleanor Kwok Building



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English



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This paper studies a simultaneous-search problem in which a player observes the outcomes sequentially, and must pay reservation fees to maintain eligibility for recalling the earlier offers. We use postgraduate program applications to illustrate the key ingredients of this family of problems. We develop a parsimonious model with two categories of schools: reach schools, which the player feels very happy upon joining, but the chance of getting into one is low; and safety schools, which are a safer choice but not as exciting. The player first decides on the application portfolio, and then the outcomes from the schools applied to arrive randomly over time.

We show that the player's payoff after applications is increasing and discrete concave in both the numbers of reach and safety schools. We also develop a recursive dynamic programming algorithm when admissions to safety schools are no longer guaranteed. We demonstrate instances in which the player applies to more safety schools when either the reservation fee gets higher or the admission probability drops lower, and articulate how these arise from the portfolio optimization consideration. This has strong managerial implications for service providers, especially for institutions that are not universally favored by prospective applicants.

Keywords: simultaneous search, dynamic programming, stochastic models, reservation fees

SPEAKER

Ying-Ju Chen is the Crown Worldwide Professor of Business and a Chair Professor at HKUST. Prior to the current position, he was a faculty in the Department of IEOR at UC Berkeley. He obtained a PhD degree in Operations Management from Stern School of Business at New York University in 2007, and he also holds master's and bachelor's degrees of Electrical Engineering from National Taiwan University.

He serves as a department/deputy editor for *NRL* and *Service Science* and a senior/associate editor for *OR*, *M&SOM*, and *POM* journals. His current research interests lie in network economics, socially responsible operations, operations-marketing interface, and supply chain management. His work has appeared in several leading journals in the fields of economics, electrical engineering, information systems, marketing, and operations research. He is ranked No. 2 among researchers world-wide by weighted corrected publication rate in Operations Management according to an article in *Decision Sciences* (2021).