

THE HONG KONG POLYTECHNIC UNIVERSITY DEPARTMENT OF MANAGEMENT AND MARKETING

Departmental Research Seminar

Predicting Multi-type Engagement Behaviors in Short Video Services: A Multi-Task Learning Approach By



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Date : 12 Nov 2025 (Wed)
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Venue : M802, PolyU

Abstract

Digital media platforms, such as short video services, are increasingly prioritizing the delivery of engaging, wholesome, and balanced content feeds to users. Effective content provision relies on modeling users' multifaceted psychological needs and predicting their multi-type engagement behaviors. Based on the Use and Gratification Theory of online media consumption, we propose employing multi-task learning to predict users' engagement behaviors. Considering the performance bottleneck known as the "see-saw effect," our theoretical analysis reveals that this limitation stems from the implicit assumption of conditional independence in traditional multi-task learning methods, which does not hold true in short video services. We design a novel model-based conditional mutual information estimation method to overcome this limitation. Two techniques, kernel neighbor sampling and variational sample generation, are adapted to address the challenge of observing non-repeatable user behaviors under given conditions, based on which conditional mutual information is estimated through contrastive learning. Extensive experiments demonstrate the effectiveness of our proposed method, particularly its strong performance in overcoming the see-saw effect. Our research contributes an innovative approach to supporting digital media platforms in optimizing content delivery, while offering a viable pathway for modeling and analyzing users' multi-dimensional psychological needs.

Prof. Xunhua Guo received his Ph.D. from Tsinghua University and is currently a Professor of Information Systems at the School of Economics and Management, Tsinghua University. His research takes behavioral and design science approaches to topics on management information systems, electronic commerce, social networks, and business intelligence. Prof. Guo has widely published in top-tier journals and conferences in the field of information systems. He serves as secretary-general of the China Association for Information Systems (CAIS, the AIS China chapter), as well as vice president of the China Information Economics Society.

All interested are welcome.



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