Interpretable Ranking Using LambdaMART (Abstract)

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In this talk we present the main results of a short paper appearing at SIGIR 2022 [1]. Interpretable Learning to Rank (LtR) is an emerging field within the research area of explainable AI, aiming at developing intelligible and accurate predictive models. While most of the previous research efforts focus on creating post-hoc explanations, in this talk we investigate how to train effective and *intrinsically-interpretable* ranking models. Developing these models is particularly challenging and it also requires finding a trade-off between ranking quality and model complexity. State-of-the-art rankers, made of either large ensembles of trees or several neural layers, exploit in fact an unlimited number of feature interactions making them black boxes. Previous approaches on intrinsically-interpretable ranking models, as Neural RankGAM [2], address this issue by avoiding interactions between features thus paying a significant performance drop with respect to full-complexity models. Conversely, we propose Interpretable LambdaMART, an interpretable LtR solution based on LambdaMART that is able to train effective and intelligible models by exploiting a limited and controlled number of pairwise feature interactions. Exhaustive and reproducible experiments conducted on three publicly-available LtR datasets show that our approach outperforms the current state-of-the-art solution for interpretable ranking of a large margin with a gain of nDCG of up to 8%.

References

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[2] H. Zhuang, X. Wang, M. Bendersky, A. Grushetsky, Y. Wu, P. Mitrichev, E. Sterling, N. Bell, W. Ravina, H. Qian, Interpretable Ranking with Generalized Additive Models, in: Proceedings of the 14th ACM International Conference on Web Search and Data Mining, WSDM '21, Association for Computing Machinery, New York, NY, USA, 2021, pp. 499–507. URL: https://doi.org/10.1145/3437963.3441796. doi:10.1145/3437963.3441796.

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