Recommender Systems for Knowledge Workers

Ralf Krestel, ZBW & Kiel University, Germany

Recommender systems are omnipresent in our daily lives: from e-commerce to social media or home entertainment. They are used to support users in a variety of tasks, e.g., to connect with people, to watch movies, or shop online; all personalized based on the user's past behavior and other contextual information. This results in recommender systems that don't rely on explicit queries for an information retrieval system, but find the right items by inferring preferences of users implicitly. With deep learning methods boosting machine learning performance to unseen levels in many tasks, also the recommender systems toolbox has been significantly expanded. Computing meaningful representations of items, whether they are textual, audio-visual, or numerical, allows better, more precise recommendations. With powerful knowledge graphs, user profiles as well as item representations can be linked to concepts and related to each other with a huge potential not only for explanations but also for grounding recommendation decisions in a broader context.

These new types of recommender systems based on deep learning methods have the potential to also transform tasks in the workplace. While artificial intelligence and machine learning in particular are already an inherent part in manufacturing, white-collar workers are missing out on latest developments in the recommender systems field. While deep learning algorithms nowadays are able to write poems, most knowledge workers are stuck with automated spelling correction. Addressing this gap particular for the workplace is highly required. Unfortunately, this endeavor will take some time: from identifying suitable tasks for the deployment of recommender systems, to evaluation settings in complex work processes.

Within the CoCo project, funded by the German government, we are in the process of building an information system for small and medium-sized businesses (SMBs) and labour scientists to jointly investigate the future of work, with an emphasis on AI methods. Following the "eat your own dog food" practice, we want to include recommender systems in our platform, which we identified as an important component for the future of work for knowledge workers. Besides established recommender systems tasks, such as recommending news, articles, topics, or connections relevant to one's work task, a focus will be placed on intelligent matchmaking: recommending people (or projects) with suitable skills. This is in some sense a continuation of the "expert finding" task, where users define a task or set of skills and an algorithm finds the best match in a database. With deep learning, we hope to circumvent manual or shallow modeling and instead learn from behavior on the platform and other resources, such as user-written reports, emails, etc., which persons are good fits to contact or include in an upcoming project.

Biography. Ralf Krestel is Professor for Information Profiling and Retrieval at ZBW — Leibniz Information Centre for Economics and Kiel University, Germany. Prior to his appointment, he was head of the Web Science Research Group at Hasso Plattner Institute at University of Potsdam and Postdoctoral Research Fellow at University of California, Irvine. He studied computer science at University of Karlsruhe and Concordia University in Montreal. In 2012, he received his Ph.D. from the University of Hannover, Germany for his work "On the Use of Language Models and Topic Models in the Web". His research centers around text mining, information retrieval, recommender systems, natural language processing, and machine learning. He studied computer science at University of Karlsruhe and Concordia University in Montreal. In 2012, he received his Ph.D. from the University of Hannover, Germany.