Ivica Kostric

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Professional Profile

Skilled data scientist and final year Ph.D. candidate specializing in conversational AI, focusing on developing methods for conversational search and recommender systems. Experience in leading research projects, mentoring students, and conducting user-centric studies. Strong technical skills in information retrieval, natural language processing, and machine learning, with a proven track record of publications at top conferences such as SIGIR, RecSys, and WSDM. Completed a six-month Applied Scientist Internship at Amazon Science, demonstrating proven ability in collaborative research, applying machine learning solutions at scale, and architecting with AWS in high-impact industry settings.

Research interests

Conversational AI, Conversational Recommender Systems, Conversational Search, Information Retrieval, Natural Language Processing, Large Language Models (LLM), Retrieval-Augmented Generation (RAG)

Education

Jul 2021 – Present
University of Stavanger – Stavanger, Norway
PhD Fellowship in Conversational AI
Supervisors: Prof. Krisztian Balog, Dr. Filip Radlinski (Google)

2019 – 2021
University of Stavanger – Stavanger, Norway
Degree: Master of Science
Programme: Master's Degree Programme in Applied Data Science
Mentors: Prof. Krisztian Balog, Dr. Filip Radlinski (Google)

2018 – 2019
University of Stavanger – Stavanger, Norway
Degree: Bachelor of Engineering
Programme: Bachelor's Degree Program in Control Engineering and Circuit Design
Programme option: Automation and Electronics Design
Mentor: Prof. Trygve Eftestøl

Selected Publications

2024 **A Surprisingly Simple yet Effective Multi-Query Rewriting Method for Conversational Passage Retrieval**
Ivica Kostric, Krisztian Balog
In: Proceedings of the 47th International ACM SIGIR Conference on Research and Development in Information Retrieval, SIGIR '24, https://doi.org/10.1145/3626772.3657933

2024 **PKG API: A Tool for Personal Knowledge Graph Management**
Nolwenn Bernard, Ivica Kostric, Weronika Łajewska, Krisztian Balog, Petra Galuščáková, Vinay Setty, Martin G. Skjæveland
In: Companion Proceedings of the ACM Web Conference 2024, WWW '24, https://doi.org/10.1145/3589335.3651247

2024 **IAI MovieBot 2.0: An Enhanced Research Platform with Trainable Neural Components and Transparent User Modeling**
Nolwenn Bernard*, Ivica Kostric*, Krisztian Balog (* equal contribution)
In: Proceedings of the 17th ACM International Conference on Web Search and Data Mining, WSDM '24, https://doi.org/10.1145/3616855.363569

2023 **Generating Usage-related Questions for Preference Elicitation in Conversational Recommender Systems**
Ivica Kostric, Krisztian Balog, Filip Radlinski
In: ACM Transactions on Recommender Systems, https://doi.org/10.1145/3629981

2022 **DAGFiNN: A Conversational Conference Assistant**
Kostric et al.
In: Proceedings of the 16th ACM Conference on Recommender Systems, RecSys '22, https://doi.org/10.1145/3523227.3551467

2021 **Soliciting User Preferences in Conversational Recommender Systems via Usage-related Questions**
Ivica Kostric, Krisztian Balog, Filip Radlinski
In: Fifteenth ACM Conference on Recommender Systems, RecSys '21, https://doi.org/10.1145/3460231.3478861

Research experience

Fall 2024 **Book Recommendation Research - Internship** (Amazon, Madrid)
Led research on book recommendation using content-based signals and LLMs. Developed novel offline evaluation metrics–beyond standard precision/recall–to predict A/B test performance in multi-widget recommendation. Metrics became core evaluation tools within the team. Research artifacts were adopted by multiple other teams, and the final recommendation algorithm was prepared for online experimentation.

Spring 2024 **Impact of Conversational Styles on Preference Elicitation in Recommender Systems** (University of Stavanger)
Led a research project to develop a conversational recommender system for the scholarly domain. Conducted a user study investigating the influence of different conversational styles on preference elicitation, task completion, and user satisfaction.

Spring 2024 **Conversational Contextual Movie Recommendation** (University of Stavanger)
Supervised a master's student in developing methods to incorporate contextual signals–such as day, time, location, and company–into a conversational movie recommender system.

Fall 2023 **Query Rewriting for Conversational Passage Retrieval** (University of Stavanger)
Led research on multi-query rewriting for conversational passage retrieval, integrating diverse rewrites into the retrieval pipeline to improve system performance. This work achieved state-of-the-art results and was accepted at SIGIR'24.

Spring 2023 **IAI MovieBot v2.0** (University of Stavanger)
Co-led the enhancement of IAI MovieBot, integrating neural components for natural language understanding and dialogue policy. Developed a platform for user research with transparent user preference modeling and an improved interface. The work was accepted at WSDM'24.

Summer 2022 **TREC CAsT 2022 participation** (University of Stavanger)
Contributed to the participation of the IAI group at Text REtrieval Conference Conversational Assistance Track (TREC CAsT), with the goal of increasing performance over a strong baseline in conversational search.

Spring 2022 **DAGFiNN: A Conversational Conference Assistant** (University of Stavanger)
Supervised a team of Master's and Bachelor's students building a multi-modal, multi-domain conversational recommender system. The system was showcased at ECIR'22 with positive feedback, and the research led to publication at RecSys'22.

Summer 2021 **TREC CAsT 2021 participation** (University of Stavanger)
Led the participation of the IAI group at Text REtrieval Conference Conversational Assistance Track (TREC CAsT), with the goal of developing a strong baseline system, which can serve as a basis for future research on conversational search.

Spring 2021 **Master's thesis** (University of Stavanger)
Conducted research on preference elicitation in conversational recommender systems by asking implicit questions based on item usage. Utilized multi-staged data annotation protocol using crowdsourcing to gather a high-quality dataset which was used to train a sequence-to-sequence neural model. This project led to publication at RecSys'21 with a TORS journal extension in 2023.

Teaching experience

Fall 2022 **Lecturer, DAT640: Information retrieval and text mining (University of Stavanger)**
Responsible for creating and presenting lecture material, guiding students through assignments and project work, and creating and evaluating the final exam. Topics include search engine architecture, text pre-processing and indexing, retrieval models and evaluation, web search, semantic search, text clustering and categorization.

Fall 2021 **Teaching assistant, DAT640: Information retrieval and text mining (University of Stavanger)**
Responsible for creating, guiding students to complete, and evaluating graded assignments and group project work. Developed a framework for automated evaluation using Pytest.

Spring 2019 - present **Teaching assistant, ELE520: Machine learning (University of Stavanger)**
Responsible for helping students solve theoretical and practical graded assignments, and evaluating assignment submissions. Topics include Bayes decision theory, estimating the statistical functions using parametric and non-parametric methods, linear discriminant functions, iterative gradient descent, neural networks, clustering.

Fall 2021 **Teaching assistant, MOD510: Modeling and Computational Engineering (University of Stavanger)**
Responsible for helping students solve theoretical and practical graded assignments, and evaluating assignment submissions. Topics include numerical derivation and integration, Monte Carlo and bootstrapping, numerically solving differential equations, simulated annealing, lattice Boltzmann, random walk, and compartment models.

Industry experience

Aug 2024 – Feb 2025 (Internship)
Amazon (Applied Scientist Intern) – Madrid, Spain
Developed and evaluated novel book recommendation strategies to improve personalization and relevance. Analyzed behavioral data for millions of customers using Spark, PySpark, and Pandas in a distributed environment. Architected scalable recommendation algorithms with AWS services. Designed offline evaluation metrics adopted as core evaluation by the team, and contributed artifacts integrated by several other teams. Prepared the final algorithm for A/B testing.

June 2020 – Aug 2024 (Part-time)
Presight Solutions (Data Scientist) – Stavanger, Norway
Responsible for researching and developing predictive models within offshore safety using machine learning algorithms. This entailed cleaning and processing raw data, training and evaluating several models, and working with the development team to integrate the models into the main application.

Sep 2018 – June 2020 (Part-time)
Presight Solutions (Software Engineer) – Stavanger, Norway
The tasks in this position included software R&D, maintenance, further development of existing products, and development of new solutions. The obligations often extended to other parts of the full life cycle of software development.

Summer 2018
Presight Solutions (R&D Intern) – Stavanger, Norway
Designed a miniature smart city model equipped with sensors and wireless communication to demonstrate real-time data integration. The project was showcased at the 2018 Nordic Edge Expo in Stavanger as part of the ”Smart City” theme.

Technical skills

Programming languages
Advanced: Python (PyTorch, Pandas, Scipy, Sklearn, Numpy), Javascript (React), .NET (C#, VB), HTML, CSS
Basic: R, Matlab, Shell script

Cloud and Distributed Computing
AWS (SageMaker, Bedrock, EC2, EMR, ECS, Lambda), Azure, MongoDB, Spark, PySpark

Software
Visual Studio Code, Git, LaTeX, Jupyter, Docker

Languages
Croatian (native), English (fluent), Norwegian (advanced), Spanish (basic)

Extra-curricular activities

Summer 2023 — **Summer School Attendee**
Attended the Summer School on Recommender Systems in Copenhagen

Fall 2020 – Present — **Reviewer for Academic Conferences and Journals**
Conferences: SIGIR'25, ECIR'23, WebConf'23 "Artifacts available"
Journals: Computer Speech & Language
Student volunteer
Conferences: ICTIR '20, SIGIR '21, ECIR '22, SIGIR '24

Fall 2017 – Spring 2018 — **Norwegian language and culture for international students**
Result Spring 2018: B

Spring 2017 — **Introduction to Computational Thinking and Data Science**
Spring 2017 — **Computational Probability and Inference**
Spring 2017 — **Learning from Data (Machine Learning)**
Courses taken on edX from Caltech and MIT

Other interests

Boardsports when the weather allows and board games when it does not.