Alessandro B. Melchiorre

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Summary

Machine Learning Researcher with a background in Computer Science Engineering.
I enjoy learning and applying my knowledge to solve difficult problems.

Experience

09/19 – 10/24 **Graduate Researcher** Johannes Kepler Universität Linz
Research on Recommender Systems, Explainable and Fair AI/ML. Current focus on multimodal text-to-image/image-to-text models (e.g., CLIP, BLIP) and their application to recommendation.

- **Developed** novel Machine Learning/Deep Learning solutions for explainable predictions and debiased recommendations. Published findings in esteemed conferences and journals. Project code, data, and pre-trained models are available online. See *Selected Publications* for more details or karapostk.github.io/publications for the full list.
- **Led** two funded science communication projects under strict deadlines with a team of 10 members, successfully delivering interactive exhibits to thousands of people. See *Funded Projects* for more details.
- **Collaborated** with colleagues to support their research, mentored students, and co-authored a publication with Deezer Music.

Education

09/19 – 10/24 **Ph.D. Computer Science** Johannes Kepler Universität Linz
Research Topics: Recommender Systems & Rankings, Explainable AI, Deep Learning and Neural Networks (PyTorch, Autoencoders, Adversarial Neural Networks), ML Fairness (Regularization, Debiasing)
Thesis title: *Explainable and Fair Music Recommender Systems.*

09/16 – 02/19 **M.Sc. Engineering in Computer Science** Sapienza Università di Roma.
Graduated with honors.
Machine Learning (Python, Data Science), Neural Networks (TensorFlow, CNNs), Big Data (Hadoop, Spark, Kafka), Natural Language Processing (word2vec, LSTMs), Advanced Programming (Web Services)
Thesis title: *Constraint-Aware Query Processing for Geo-Distributed Data.*

09/13 – 06/16 **B.Sc. Engineering in Computer Science** Università degli Studi di Napoli Federico II.
Graduated with honors.
Software Engineering (UML, Design, Analysis, Testing), Computer Programming (C/C++, Java), Databases (SQL, DBMS), Networks
Thesis title: *Comparison of Commerical Concurrent Versioning System Tools.*

Skills

Coding	Python (Proficient), Java and SQL (Advanced), C/C++ and JavaScript (Familiar)
Machine Learning	PyTorch, NumPy, pandas, Ray Tune, scikit-learn, Keras, and TensorFlow
Development	git, GPU Training, Jupyter, Weight&Biases, bash
Big Data	Spark and Hadoop (Previous Experience)

Skills (continued)

Soft Skills	Curious, Goal-oriented, Teamwork, Leadership
Languages	Italian (Native), English (Fluent), German (Beginner)

Selected Publications

ECML'24 — A. B. Melchiorre, S. Masoudian, D. Kumar, M. Schedl "*Modular Debiasing of Latent User Representations in Prototype-based Recommender Systems*" published at European Conference on Machine Learning 2024
Best Student Paper Award. Developed new approach for modular debiasing of latent embedding of pre-trained ML recommendation models. Presented in Vilnius, Lithuania to a crowd of 800 people.
Keywords: Adversarial Learning, Debiasing, Multi-objective Optimization, Classification, Recommender Systems, Ranking, Fairness.

RecSys'23 — A. B. Melchiorre, C. Ganhör, N. Rekabsaz, M. Schedl "*ProtoMF: Prototype-based Matrix Factorization for Effective and Explainable Recommendations*" published at ACM Conference on Recommender Systems 2022
Developed novel effective recommendation algorithm for explainable predictions and model's insights. Presented in-person in Seattle, USA to a crowd of 650 people.
Keywords: Multi-objective Optimization, Recommender Systems, Ranking, Explainability.

AI Magazine — D. Afchar*, A. B. Melchiorre*, M. Schedl, R. Hennequin, E. V. Epure, M. Moussallam "*Explainability in Music Recommender Systems*" article published in AI Magazine 2022
Surveyed strategies to integrate Explainability in Music Recommender Systems. Collaboration with Deezer Music.
Keywords: Recommender Systems, Explainability.

ECIR'21 — A. B. Melchiorre*, V. Praher*, M. Schedl, G. Widmer "*LEMONS: Listenable Explanations for Music recOmmeNder Systems" published at European Conference on Information Retrieval 2021*
Built a tool for explainable predictions based on CNNs trained on audio spectrograms.
Keywords: Classification, CNNs, Images, Recommender Systems, Explainability

Funded Projects

02/22 – 09/22 — **Project Leader** for Ars Electronica Festival "Black Holes of Popularity"
Managed a team of 11 people for the development of an interactive exhibit showcased at an international science/arts festival. Responsibilities included: coordination, planning, system design, recruiting, and budgeting.
Awarded budget: 62.000 EUR
Keywords: Computer Vision, Python

02/21 – 09/21 — **Project co-Leader** for Ars Electronica Festival "Emotion-aware Music Tower Block"
Supported a team of 9 people for the development of an interactive exhibit showcased at international science/arts festival. Responsibilities included: system design, data analysis, API development, task assignment.
Awarded budget: 54.000 EUR
Keywords: Data Analysis, Python

Hobbies and Interests

Running (participating in races: 10 km, 21 km, 42 km), Meal-Prepping, Piano.
References available on request.