Alejandro Mottini

Applied Scientist, PhD

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Summary

Experienced AI and Machine Learning professional with over a decade of experience building cutting-edge AI products and production systems. My expertise spans areas such as LLMs, Recommender systems, and Multi-modal / Graph-based models, with a particular focus on combining cutting-edge approaches with practical business impact.

Experience

Amazon — *Seattle, WA*

Sr. Applied Scientist - Tech Lead / Science Manager - Store Foundation AI — *2020 - Current*

- Lead applied science initiatives focused on developing LLM-powered generative and representation (embedding) models that are applied across Amazon to achieve step-function improvement on business applications.
- Working on creation of in-house multi-modal LLM specialized in shopping tasks (product VQA, product substitution assessment, etc.), purposely built for Amazon Stores applications to drive new business opportunities across organizations.
- Developed and deployed multi-modal and graph-based models for learning representation of shopping entities (Amazon Product, Search Query, Product Brand, etc). These representations were vended to internal teams, powering over 25 product launches.
- Managed and scaled AI teams (science, engineering and product; from 3 to 14 members), overseeing projects from conception to production, working along internal customers to produce annualized revenue in the hundreds of millions.

Applied Scientist - Alexa AI - Data Services — *2019 2020*

- Worked on novel approaches to data labeling that significantly reduced costs while preserving user privacy, improving labeling services and products for Machine Learning systems across Alexa.
- Led the development and launch of multiple AI products including a Transformer-based End-to-End Spoken Language model for automatic data labeling, a De-Noising Auto-Encoder-based Voice Conversion model for user privacy enhancement, and Label Confidence and Bias prediction models for enhancing label quality.

Applied Scientist - Alexa AI - Personalization — *2018 2019*

- Participate in the development, evaluation and deployment of machine learning models and analytical solutions for multiple applications, with an emphasis in personalizing the Alexa experience. The end goal is to deliver an instantly familiar personal assistant for our customers through the application of cutting-edge scientific techniques.
- Developed from conception to launch the personalization of 2 Alexa experiences (Jokes and Routine Automation)
- Contributed to the development of the Alexa Personalization Platform, a system Alexa application owners could use to personalize their experiences (implemented new features such as use of Fast Text embeddings for item feature computation, and frequent pattern mining capabilities).

Amadeus IT Group — *Sophia Antipolis, France*

Data Scientist - Innovation and Research Group — *2015 - 2018*

- Conceptualize new research ideas, develop prototypes and perform data analysis for applications in the travel industry. Collaboration with other internal teams, customers and third parties (academia, start-ups).
- Worked on models for Ads (CTR prediction, customer segmentation), Offer Personalization (choice models for airline ticket purchase prediction) and Synthetic Data Generation for multiple customers (Copenhagen Airport, Cathay Pacific, etc.)

Ericsson — *Montevideo, Uruguay*

Integration Engineer — *2009 - 2010*

- WCDMA RAN Configuration and Integration. Deployment of 3G/2G cellular networks, integration of Radio Base Stations, coordinating the work of the technicians on the field remotely in collaboration with the project managers.

Skills

AI/ML	LLMs, Multi-modal and Graph-based models, Computer Vision, Personalization, Ranking.
Software and OS	Python, PyTorch, Tableau, Matlab, Git, Linux, MS Office.
Big data analytics	PySpark, SQL, AWS Services (S3, EC2, EMR, Bedrock)
Languages	Spanish (native), English (fluent), French (fluent), German (basic).

Education

INRIA - University of Nice Sophia Antipolis *Nice, France*

PH.D. IN AUTOMATION AND SIGNAL PROCESSING *2011 - 2014*

- *Thesis*: Axonal Morphology Analysis From Image Processing to Modeling.
- *Topics covered*: Classification of neurons using image processing and machine learning.
- Teaching Assistant in Dept. of Informatics, supporting several Bachelor and Master level courses (Image Processing, Python, etc.).

University of Nice Sophia Antipolis *Nice, France*

M.SC. COMPUTATIONAL BIOLOGY AND BIOMEDICINE *2010 - 2011*

- *Topics covered*: Machine learning , Biomedical Data Analysis, Bioinformatics.

Universidad de la Republica *Montevideo, Uruguay*

ELECTRICAL ENGINEER DEGREE (MASTER LEVEL) *2003 - 2009*

- *Topics covered*: Signal Processing, Applied Mathematics, Telecommunications and Electronics.

Recent Publications & Patents

- **Mottini, A.**, Zhang, H., Cui, Q., Yun, S., Vasiloudis, I., and Song, X, *Graph-aware Representation Large Language Models*, U.S. Patent Application 18/ 978.419 (patent pending) (2024)
- Cardella, A.T., Victor, A., Gupta, V., Du, Z., Malik, J R., Li, L.E. and **Mottini, A**, *Label confidence scoring*. U.S. Patent No. 12,148,417.(2024).
- Zheng, D., Song, X., Zhu, Q., Zhang, J., Vasiloudis, T., Ma, R., Zhang, H., Wang, Z., Adeshina, S., Nisa, I. **Mottini, A.**, Cui, Q., Rangwala, H., Zeng, B., Faloutsos, C. and Karypis, G., *GraphStorm: All-in-one graph machine learning framework for industry applications*. In Proc KDD (2024)
- Trueba, J.L., **Mottini, A.**, Drugman, T.R., and Karlpati, S.V.K, *Synthetic speech processing*, U.S. Patent No. 11,735,156 (2023).
- Agost, R.A., **Mottini, A.**, and Renaudie, D., *Machine learning methods and systems for predicting online user interactions*, US Patent No. 10,943,184, (2021).
- Agost, R.A., Lheritier, A., **Mottini, A.**, and Renaudie, D., *Systems and methods for real-time online traveler segmentation using machine learning*, US Patent No. 11,120,480 (2021).
- **Mottini, A**., Trueba, J., Karlapati, S.V.K., and Drugman, T., *Voicy: Zero-shot non-parallel voice conversion in noisy reverberant environments*. In Proc. 11th ISCA Speech Synthesis Workshop (2021).
- Chen, Y., Weiyi, L., **Mottini, A**, Li Erran Li, Droppo, J., Zheng, D., Zeng, B., *Top-down attention in end-to-end spoken language understanding*. In Proc. ICASSP (2021).
- **Mottini, A** and Chowdhury. A.R, *What Do You Mean I'm Funny? Personalizing the Joke Skill of a Voice-Controlled Virtual Assistant*. In Proc. AAAI 2020 Workshop on Interactive and Conversational Recommendation Systems (2019).