Diego **Antognini**

RESEARCH SCIENTIST IN MACHINE LEARNING & NATURAL LANGUAGE PROCESSING

✉ diegoantognini@gmail.com | 🖥 www.diegoantognini.com

🎓 Diego Antognini | ⌨ Diego999 $2.5k\star$ | 💼 diegoantognini | 🇨🇭 Swiss citizen

Summary

6+ years of research experience in natural language processing (NLP), machine learning (ML), and multi-objective recommendation systems. Experienced in developing efficient models for on-device inference (order of one *MB* model size and one *ms* latency) and interpretable models that generate personalized and actionable textual explanations. Supervised 60+ B/M.Sc. projects/theses. Assessed 50+ student projects. Offering consulting services in NLP and ML.

Experience

Research Scientist	**IBM Research AI**
May 2022 - present	*Zürich, Switzerland*

- My research is centered around efficient machine learning for NLP: alternatives to transformer-based language models, novel cost-effective pre-training methods via self-supervision, or better leverage data with active learning. I build models in the order of one-megabyte size, targeted for edge use cases (smart watches or assistants) to provide on-device inference with similar performance and higher throughput than large models.
- Deployed models in the order of 1MB size and 1ms latency used in *IBM Deep Search* that analyzes in real time scientific publications and patents.
- Produced 3 papers in AI & ML leading venues and 4 patents, all under review. Served in the program committee for EMNLP '22 and RecSys '22.

Lecturer and Supervisor for M.Sc. theses in NLP	**HSLU - Lucerne University of Applied Sciences**
Apr. 2022 - present	*Luzern, Switzerland*

- Teaching deep learning for natural language processing classes in the course "Computational Language Technologies" with Dr. Kornelia Papp.
- Supervised 3 M.Sc. theses in the field of NLP and associated with companies in the area of insurances and data visualization.

Consultant and Expert for B.Sc. & M.Eng. theses	**HES-SO - HE-ARC – University of Applied Sciences**
Jun. 2015 - present	*Neuchâtel, Switzerland*

- Gave talks on multiple technologies and offered consulting services for applied research in industrial projects in Prof. Hatem Ghorbel's group.
- Assessed 30+ B.Sc./M.Eng. theses and was an expert for the AI and GPU/parallel programming exams (Prof. Hatem Ghorbel, Prof. Cédric Bilat).

Visiting Researcher in Prof. Julian McAuley's group	**UCSD – University of California San Diego**
Jul. 2021 - Oct. 2021	*San Diego, CA, U.S.A.*

- Created an unsupervised critiquing method and a generative language model to help users rewrite cooking recipes to satisfy dietary restrictions.

Research/Teaching Assistant	**EPFL – École Polytechnique Fédérale de Lausanne**
May 2017 - Mar. 2022	*Lausanne, Switzerland*

- Helped in teaching the courses: intelligent agents (M.Sc.), introduction to natural language processing (M.Sc., 2x), artificial intelligence (B.Sc., 3x).
- Supervised 30+ B./M.Sc. semester projects & theses. Worked with the data analytics & AI research team in Swisscom (led by Dr. Claudiu Musat).

Machine Learning/Data Mining M.Sc. thesis Intern	**Iprova GmbH**
Sep. 2016 - Mars. 2017	*EPFL Innovation Park, Lausanne, Switzerland*

- Deployed a system to extract concepts from large corpora and build interactive knowledge graphs for invention developers to gain new insights.

Education

Ph.D. in Computer Science	**EPFL – École Polytechnique Fédérale de Lausanne**
May 2017 - Mar. 2022	*Lausanne, Switzerland*

- **Advisor**: Prof. Boi Faltings. **Group**: the Artificial Intelligence Lab (LIA). **Program Committee & Reviewer**: *ACL 20-22; EMNLP 20-21; RecSys '21.
- **Award**: Won $9,750 in the *IARPA Geopolitical Forecasting Challenge 2018*. Press coverage: *EPFL News (English)* and *24 Heures (French)*.
- **Thesis** 📄: Textual Explanations and Critiques in Recommendation Systems. It solves two challenges: explanation generation and making them actionable (critiquing). It focuses on text understanding, explainable AI, and conversational recommendation. Fastest to graduate in the AI lab.
- Wrote 16 papers in AI & ML leading venues. 14 published: 7 conference, 6 workshop, and 1 demo. 2 papers currently under review at EMNLP 2022.
- Implemented the 1st PyTorch graph attention network and its sparse variant. Starred and forked on Github 2.7k+, and still 8k+ views per month.

M.Sc. in Computer Science	**EPFL – École Polytechnique Fédérale de Lausanne**
Sep. 2014 - Apr. 2017	*Lausanne, Switzerland*

- Focus on NLP, AI, ML, and distributed systems. It includes a mandatory extra year of 62 ECTS credits to be accepted in the program. **GPA**: 5.5/6.0.
- **Thesis**: From Relation Extraction to Knowledge Graphs (6.0/6.0). Developed a model that extracts concepts from large corpora and classifies the semantic relationship between them. It outperformed state-of-the-art models by 0.9 F1-score in the relation-classification task of SemEval-2010.

B.Sc. in Computer Science	**HES-SO - HE-ARC – University of Applied Sciences**
Sep. 2011 - Aug. 2014	*Neuchâtel, Switzerland*

- Major software engineering. **Awards**: 1) Excellent thesis and 2nd best GPA; 2) Deserving student in 2nd year. **GPA** 5.6/6.0.
- **Thesis**: Computing Brain Neuronal Maps. Developed a multi-GPUs algorithm to compute an accurate 3D real-time rendering of the brain's electromagnetic activities. A speedup of ≈100,000x has been achieved, reducing the computation time from 20h to 700ms.

Publications (selected)

Interacting with Explanations through Critiquing 📄	**IJCAI 2021**
Diego Antognini, Claudiu Musat, Boi Faltings	

Fast Critiquing with Self-Supervision for VAE-based Recommender Systems 📄	**RecSys 2021**
Diego Antognini and Boi Faltings	

Multi-Dimensional Explanation of Target Variables from Documents 📄 — **AAAI 2021**
Diego Antognini, Claudiu Musat, Boi Faltings

Rationalization through Concepts 📄 — **ACL 2021**
Diego Antognini and Boi Faltings — *Findings*

Addressing Fairness in Classification with a Model-Agnostic Multi-Objective Algorithm 📄 — **UAI 2021**
Kirtan Padh, Diego Antognini, Emma L. Glaude , Boi Faltings , Claudiu Musat

Multi-Gradient Descent for Multi-Objective Recommender Systems 📄 — **AAAI 2020**
Nikola Milojkovic, Diego Antognini, Giancarlo Bergamin, Boi Faltings, Claudiu Musat — *Workshop*

HotelRec: a Novel Very Large-Scale Hotel Recommendation Dataset 📄 — **LREC 2020**
Diego Antognini and Boi Faltings

Talks

Textual Explanations and Critiques in Recommendation Systems — **2022**
EPFL, Lausanne.

Deep Learning with PyTorch
HES-SO - HE-ARC – University of Applied Sciences, Neuchâtel.

Transformers for Time-Series predictions — **2021**
HES-SO - HE-ARC – University of Applied Sciences, Neuchâtel.

Fast Critiquing with Self-Supervision for VAE-based Recommender Systems
RecSys 2021, Amsterdam.

Rationalization through Concepts
ACL 2021, Online.

Interacting with Explanations through Critiquing
1) IJCAI 2021, Online; 2) University of Toronto, Online; 3) Swisscom Lab, Online.

Multi-Dimensional Explanation of Target Variables from Documents
AAAI 2021, Online.

T-RECS: a Recommender Generating Explanations and Integrating Critiquing — **2020**
ECAI 2020, Online.

Multi-Dimensional Explanation of Ratings from Reviews
1) University of Zürich, Zürich; 2) NLP Meetup 🎥, Zürich; 3) Swisscom AI, Online.

1) What are attention mechanisms?; 2)Overview of principles & models in recommender systems
HES-SO - HE-ARC – University of Applied Sciences, Neuchâtel.

Learning to Create Sentence Semantic Relation Graphs for Multi-Document Summarization — **2019**
EMNLP 2019, Hong-Kong.

Introduction to 1) PyTorch, 2) Spark, 3) [Contextualized] Word Embeddings, 4) Dialogue Systems
HES-SO - HE-ARC – University of Applied Sciences, Neuchâtel.

Constraint Satisfaction Problem — **2018**
Artificial intelligence course at EPFL, Lausanne.

Introduction to ML & Insights on Alpha Go (Zero)
High school du Bugnon, Lausanne.

From Relation Extraction to Knowledge Graphs — **2017**
1) NLP Meetup, Zürich; 2) NLP course at EPFL, Lausanne; 3) HE-Arc, Neuchâtel.

Skills

Software	Efficient: Python, PyTorch, spaCy, Tensorflow, Spark, Bash. Prior Experience: C++, CUDA, Java, SQL, PHP, HTML/CSS.
Miscellaneous	UNIX/Linux, Git, PyCharm, IntelliJ IDEA, Astah, Balsamiq Mockups, Visual Studio, Eclipse.

Interests

Languages	French (native), English (fluent), German (conversational), Spanish (conversational), Italian (conversational).
Sport	I ride motorbikes in spring or surf on the coast during summer. In-between, I go four times per week to the gym to stay fit.
Interests	I regularly read self-development books and question myself to become a better person. I have traveled to 25 countries through 4 continents; I would like to keep going and discover new cultures. Finally, I love dancing salsa and bachata.

References

Dr. Cristiano Malossi	**Dr. Claudiu Musat**	**Prof. Boi Faltings**	**Prof. Julian McAuley**
Principal Research Manager	Research Manager	Full CS Professor	Full CS Professor
IBM Research AI, Switzerland	Google, Switzerland	EPFL, Switzerland	University of California, San Diego
Current manager	Close collaborator	Thesis advisor	Research stay host
✉ ACM@zurich.ibm.com	✉ claudiu.musat@gmail.com	✉ boi.faltings@epfl.ch	✉ jmcauley@ucsd.eng.edu