

Andrei Manolache

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EDUCATION

IMPRS-IS & ELLIS; University of Stuttgart

Oct. 2022 - Ongoing

PH.D. IN ARTIFICIAL INTELLIGENCE

I am a Ph.D. student enrolled in the International Max Planck Research School for Intelligent Systems (IMPRS-IS) and the European Laboratory for Learning and Intelligent Systems (ELLIS) Ph.D. programs. My main affiliation is with the University of Stuttgart, under the supervision of Mathias Niepert, and co-advised by Karsten Borgwardt of the Max Planck Institute for Biochemistry. My Ph.D. research focuses on the design and development of Geometric Deep Learning methods where robustness and trustworthiness are an integral part of the research.

University of Bucharest, Faculty of Mathematics and Computer Sciences

Oct. 2019 - Jun. 2021

M.Sc. IN ARTIFICIAL INTELLIGENCE, VALEDICTORIAN DISTINCTION

Relevant coursework: Probabilistic Programming, Theoretical Machine Learning, Knowledge Representation & Reasoning, Statistical Learning, Deep Learning, Information Retrieval, Text Mining, Geometric Deep Learning

Thesis: Deep Anomaly Detection in Text (ENG), Grade 10/10

Teacher Assistant (TA): Deep Learning (ENG), Advanced Machine Learning (ENG), Operating Systems (RO)

University of Bucharest, Faculty of Mathematics and Computer Sciences

Oct. 2016 - Jun. 2019

B.Sc. IN MATHEMATICS AND COMPUTER SCIENCES, FIRST CLASS HONOURS

Relevant coursework: Real & Complex Analysis, Measure Theory, Probabilities, Mathematical Statistics, Differential Geometry, Linear & Abstract Algebra, Differential Equations, Operations Research, Numerical Methods, Cryptography, Algorithms & Data Structures, Object-Oriented Programming, Databases, Machine Learning, Deep Learning

Thesis: Autonomous Driving, Ackermann-Steered Vehicle (RO), Abstract (ENG), Grade 10/10

Tutor: Procedural Programming

PUBLICATIONS AND PATENTS

Probabilistically Rewired Message-Passing Neural Networks.

Chendi Qian*, Andrei Manolache* et al.

Under Review

AD-NLP: A Benchmark for Anomaly Detection in Natural Language Processing.

Matei Bejan*, Andrei Manolache*, Marius Popescu

EMNLP 2023

Time Series Anomaly Detection using Diffusion-based Models.

Ioana Pintilie*, Andrei Manolache, Florin Brad

ICDM 2023 AI for Time Series Workshop

Probabilistic Task-Adaptive Graph Rewiring.

Chendi Qian*, Andrei Manolache* et al.

ICML 2023 Workshop on Differentiate Almost Everything

VeriDark: A Large-Scale Benchmark for Authorship Verification on the Dark Web.

Andrei Manolache*, Florin Brad* et al.

NeurIPS 2022

AnoShift: A Distribution Shift Benchmark for Unsupervised Anomaly Detection.

Marius Dragoi*, Elena Burceanu*, Emanuela Haller*, Andrei Manolache, Florin Brad

NeurIPS 2022

Rethinking the Authorship Verification Experimental Setups.

Florin Brad*, Andrei Manolache* et al.

EMNLP 2022

ICLR 2021 Challenge for Computational Geometry & Topology: Design and Results.

Nina Miolane, et al. [including Andrei Manolache]

arXiv preprint

DATE: Detecting Anomalies in Text via Self-Supervision of Transformers.

Andrei Manolache*, Florin Brad, Elena Burceanu

NAACL 2021; ICML 2021 UDL Workshop

Systems and Methods of Detecting Chatbots.

Florin Brad, Andrei Manolache, Elena Burceanu

US Patent App. 18/320.250, Filled 05/19/2023

Anomaly Detection Systems And Methods.

Andrei Manolache, Florin Brad, Elena Burceanu, Alexandru Novac

US Patent App. 17/301.641, Filled 04/09/2021

WORK EXPERIENCE

BITDEFENDER | DEEP LEARNING RESEARCH SCIENTIST

Oct 2019 – Present

- I'm currently involved in the [European Lighthouse of AI for Sustainability \(ELIAS\)](#) project.
- I did research on deep neural language models trained via self-supervised learning for anomaly detection and more general representation learning.
- Various projects dealing with authorship detection, topic modelling and anomaly detection on text and heterogenous data.

NXP SEMICONDUCTORS | VISION & ADAS SOFTWARE ENGINEER

May 2019 - Oct 2019

- I've worked on the automotive neural network inference engine that's using NXP's hardware accelerator. I've worked on the core engine that was written in C and C++ and also explored methods for neural network quantization, pruning and optimization.

NXP SEMICONDUCTORS | OS SOFTWARE ENGINEER INTERN

Feb 2018 - May 2019

- I've built an autonomous driving, Ackermann-steered, 1/10 scale car using the Robot Operating System and Linux. The project required state-of-the-art planning, SLAM and computer vision algorithms. I wrote the code in Python and C++. This project was my B.Sc. thesis.

PROJECTS, AWARDS AND MISCELLANEA

DARWIN

DEEP LEARNING, NLP, AUTHORSHIP DETECTION, ANOMALY DETECTION, FEW-SHOT LEARNING

I was a member of Project DARWIN, funded with 246.000€ by Romania's Ministry of Education. We developed forensics methods which can help identify and profile the activity of cyber-criminals on the Dark Web and map it to their activity in the Clear Web in order to monitor and combat cyber-crimes.

EEML 2022 - TEACHING ASSISTANT

Misc

I was a Teaching Assistant at the 2022 edition of the East European Machine Learning Summer School.

EEML 2021 - BEST POSTER AWARD

DEEP LEARNING, ANOMALY DETECTION, NLP

I got the best poster award at the 2021 edition of the East European Machine Learning Summer School.

ICLR 2021 COMPUTATIONAL GEOMETRY & TOPOLOGY CHALLENGE

TDA, GEOMETRIC LEARNING

Our challenge submission, [Topological noise invariant features using Giotto-TDA and Geomstats](#), was awarded the 1st place at the ICLR 2021 Computational Geometry & Topology Challenge. We showcased a pipeline for extracting Perturbed Topological Signatures (PTS) using [Geomstats](#) and [Giotto-TDA](#) and analyzed the robustness of these representations.

PYTORCH GLOBAL SUMMER HACKATON 2020

DEEP LEARNING, CV, NLP, VQA

Our hackaton submission, [Q&Aid](#), was awarded the 1st place at the PyTorch Global Summer Hackaton 2020. Q&Aid is a conversational agent that relies on a series of machine learning models to filter, label and answer medical questions. My contribution was doing the research on various models (VQA, Vision) and help integrate them to the project.

STUDENTS SCIENTIFIC COMMUNICATIONS SESSION 2019 & 2021

I was awarded the 1st place at the Faculty of Mathematics and Computer Sciences' Students Scientific Communications Session twice: for my bachelor's thesis in 2019, and for my master's thesis in 2021.

MATHEMATICAL STATISTICS READING GROUP 2019

MATHEMATICAL STATISTICS

I've co-organized a students' mathematical statistics reading group in 2019 at the University of Bucharest and Politehnica University of Bucharest.

TECHNICAL SKILLS

Advanced: PyTorch, Python, Linux

Intermediate: C, C++, R, Prolog, JavaScript, HTML & CSS, SQL, MatLab, ROS

Misc: \LaTeX , Git, Photoshop & GIMP, Illustrator & Inkscape

LANGUAGE SKILLS

Romanian: Native

English: Proficient

French, German: Basic (simple words and phrases)