Nikiforos Pittaras, PhD
Machine Learning researcher / engineer

Machine Learning, AI and Data Science enthusiast, focused
on research and development of deep learning methods for text
& multimedia, and investigations into AI safety and alignment

🌐 https://npit.github.io
✉ pittarasnikif@gmail.com

</> python, java, matlab, C++
🗄 pytorch, sklearn, sb3
🛢 mysql, postgres, cassandra
>_ docker, bash, git, linux

EDUCATION 🏛 🎓

- **PhD in Machine Learning**: (University of Athens & NCSR Demokritos) 2017-2021
  4-year doctorate, awarded with an SNF Industrial Scholarship, Grade 'Excellent'.
  Specialized in augmenting Deep Neural Representations with external information for ML tasks.
  Developed a Hate Speech Detection system from research findings for industry deployment.
  Thesis: "Beyond Deep Learning: Enriching Data Representations for Machine Learning Tasks" 📄 🔲
  > `python, tensorflow, keras, pytorch, DNN, nltk, Wordnet, ray, mlflow, restx`

- **MSc in Signal/Information Processing & Learning**: (University of Athens) 2015-2018
  2-year Master's degree, focused on Signal Processing and Machine Learning. Grade 8.78.
  Specialized in Machine Learning, Signal and Multimedia Analysis and Processing, Ontology Engineering
  Thesis: "Multimodal video classification with deep neural networks" 📄
  > courses: {`matlab, java, C++, python`}, thesis: {`python, tensorflow, keras, DCNN, LSTM`}

- **BSc in Computer Science**: (University of Ioannina) 2005-2013
  4-year Bachelor's degree (Ptychion), with a focus on Machine Learning, AI and VLSI. Grade 7.08.
  Specialized in Machine Learning and Artificial Intelligence, Multimedia Processing, Hardware Design
  Thesis: "Image registration using unified particle swarm optimization" 📄
  > courses: {`C, C++, java, matlab, opengl, vhdl`}, thesis: {`matlab, unified PSO`}

PROFESSIONAL EXPERIENCE 🏭 ★

1. **ML Research Scientist**: UL - DSRI/AIID - Remote / Athens, Greece (part-time) February 2024 - present

   - **AI Taxonomy Engineering**: Technical AI taxonomy development, annotation of public AI incident reports.

2. **Senior ML Engineer**: bunny.net - Remote / Athens, Greece January 2023 - present

   - **ML Engineering**: Model design, implementation, training, tuning, explainability analysis and deployment, using RL (envirnoment / reward engineering) and ML (regression, classification) methods for CDN optimization.
   - **Video Generation**: Setup / customization of scalable text/image-to-video generation pipelines with StableDiffusion.
   > `python, pytorch/ptl, gym, sb3, sklearn, captum, docker, fastapi, influxdb, stable-diffusion, rabbitmq, mongo`

3. **ML Research Scientist**: RAIC/AIID - Remote / Athens, Greece (part-time) July 2022 - December 2022

   - **AI Taxonomy Engineering**: Technical AI taxonomy development for system goals, technologies and failures.
   - **Academic Writing**: Scientific publication authorship for work and result disemination and presentation.

4. **Postdoc ML Research Engineer**: IIT-NCSRD/ICS-FORTH - Athens, Greece Nov 2021 - April 2023

   - **R&D / Text ML**: Research, ML and backend engineering on argumentation mining on articles for the Debatelab project. Active learning, clustering, topic modelling and token / text classification with transformer models.
   > `python, pytorch, transformers, BERT, flair, elasticsearch, fastapi, docker`

5. **Senior ML Engineer**: LANGaware - Athens, Greece June 2021 - December 2022

   - **ML Engineering**: Pipeline develvopment and maintenance for multimodal neurodegenerative disease prediction. Design and implementation of ETL and classification procedures, interpretability analysis.
   - **ML Prototyping**: Work with the Data Science team to implement new solutions, experiments and prototypes.
   - **Academic & Technical Writing**: Authorship of scientific papers, proposals and reports on ML work.
   > `python, sklearn, RF, numpy, spacy, nltk, librosa, gcp`

6. **AI Alignment Researcher**: Independent / EA-LTFF - Athens, Greece   June - October 2022

   - **R&D on RL**: Reinforcement Learning environment design and engineering. Agent communication and betrayal pattern analysis for cooperative tasks, empirical environment validation with experiments.
   - **Academic Writing**: Publication authorship, experiment planning, execution and analysis.
   - `> python, pytorch, gym, stable-baselines3, pettingzoo, docker, wandb`

7. **Teaching Assistant**: Center for AI Safety - MLSS program - Remote / Athens, Greece   June-August 2022

   - **TA**: Theoretical / technical support on advanced Machine Learning, Deep Learning, AI Safety and Alignment.
   - `> python, pytorch, gradescope`

8. **Lead ML Engineer**: SciFY- Athens, Greece (part-time)   Nov. 2020-August 2021

   - **ML Engineering**: Development, maintenance, evaluation of text classification pipelines in the legal domain.
   - `> python, sklearn, numpy, nltk, pytorch, transformers, BERT, flask`

9. **Research Associate/ ML & Backend Engineer**: ILSP-ATHENA - Athens, Greece   Feb.-Dec. 2019

   - **R&D on Text ML**: Lead developer on multimodal topic modelling on scientific publications for the D4I research project. Pipeline maintenance and extension, administration and deployment.
   - **Result analysis and reporting**: Meta-analysis, data aggregation, visualization and presentation; indicator engineering and impact assessment. Project report compilation and authoring.
   - **System / backend administration**: VM / system management and setup, database extension / optimization.
   - `> java, mallet, LDA, spring, postgres, python, sklearn, django, flask`

10. **Research Associate / Lead ML Engineer**: IIT-NCSRD - Athens, Greece   June 2016 - Sep. 2021

    - **R&D on Text ML**: Text & social media big data mining for event detection, clustering, summarization, recommendation, entity resolution, semantic search, personalization, for the BDE and Storybot research projects.
    - **System admin. & engineering**: Software container design, backend / REST development, website migrations.
    - **Academic Writing**: Publication authorship, experiment planning, execution, automation and analysis.
    - **Community management**: Organization of the internal REPR and CAKT research groups
    - `> java, docker, cassandra, spark, bash, jax-rs, pyinsect, NGG, glassfish`

11. **Research Associate / Lead ML Engineer**: ITI-CERTH - Thessaloniki, Greece   Feb. 2014 - Sep. 2015

    - **R&D on CV**: Visual descriptor engineering for the LinkedTV and ForgetIT projects; Lead development, design and CPU/GPU optimization of video concept detection, image retrieval, search and visualization pipelines.
    - **R&D on Deep CV**: Research on deep learning methods for video concept detection with DCNNs. Lead design, development and maintenance of retrieval / search DCNN pipelines for real-time execution.
    - **Academic Writing**: Publication authorship, experiment planning, execution, automation and analysis.
    - `> C++, matlab, opencv, libsvm/linear, caffee, matconvnet, DCNN, openmp, cuda`

ACADEMIC / SCIENTIFIC ACTIVITIES   👥 ⚗

- **Teaching / Supervision**:
  - Co-supervision of BSc / MSc theses and Internships related to Machine Learning, NCSRD, 2017-2021
  - Student group theoretical / technical support, coordination and organization, NCSRD, 2017-2021
  - Scientific lectures and presentations on the NCSRD CAKT and REPR research groups, 2017-2019
  - Course assistant (Data Structures, OOP, SoftEng for Networks Applications, Data Mining), UoA, 2015-2020

- **Conference / Event facilitation**:
  - Workshop organizer / chair (MultiLing 2019, FNP-FNS 2020-2023)
  - Program Committee (AACL-IJCNLP2020, SLT 2021, FNP-FNS 2021-2023, SDPRA 2021)
  - Paper Reviewing (ICTAI, ACL, MLj, CIj, SLSP, CSL, openreview, CSET, etc.)
  - Technical support (Multiling 2017, AI4EU Athens), research proposal evaluation (AI4Copernicus)

- **Seminar / Workshop / Course participation**:
  - Multiple courses on gen-AI, prompt eng., RHLF, vector-based retrieval etc., deeplearning.ai (2023 - present).
  - AGI Safety Fundamentals 2022 (Effective Altruism Cambridge, virtual, Jan - Mar 2022)
  - AI Safety Camp (virtual research workshop, working on Deep Multiagent RL, Jan - Jun 2022)
  - "Stanford Existential Risk Initiative" Conference, 2022, virtual (Winter 2022)
  - Reinforcement Learning / DRL courses (2), (Coursera, Huggingface, 2022-2023)
  - "Deep Learning in NLP" summer school (RANLP 2019, Fall 2019).
  - Academic CompSci seminars (5), (DIT-UoA, 2015-2018)
  - "CretaMASSS-2013 / HAISS'13-Agents" summer school on multi-agent systems & AI (TUoC, 2013).

PUBLICATIONS 📊 📖

- **Journals**:
  1. N. Pittaras, G. Giannakopoulos, P. Stamatopoulos, V. Karkaletsis, "Content-based and Knowledge-enriched Representations for Classification Across Modalities: a Survey", ACM Computing Surveys, 2023 📖.
  2. N. Pittaras, G. Giannakopoulos, G. Papadakis, V. Karkaletsis, "Text classification with semantically enriched word embeddings", JNLE Special Issue: Informing Neural Architectures for NLP with Linguistic and background Knowledge, 2020 📖
  3. F. Markatopoulou, V. Mezaris, N. Pittaras, I. Patras, "Local Features and a Two-Layer Stacking Architecture for Semantic Concept Detection in Video", IEEE TETC, 2015 📖.

- **Conferences / Workshops** (sampled out of > 25 total – full list here):
  1. N. Pittaras, and McGregor, S. "A Taxonomic System for Failure Cause Analysis of Open Source AI incidents", SafeAI Workshop, AAAI 2023, Wahsington DC 📖.
  2. N. Pittaras "A Cooperative Reinforcement Learning Environment for Detecting and Penalizing Betrayal", MLSafety Workshop, NeurIPS 2022, virtual 📖.
  3. N. Pittaras, V. Karkaletsis, "A study of semantic augmentation of word embeddings for extractive summarization", Multliling Workshop, RANLP2019, Varna, Bulgaria 📖.
  4. N. Pittaras, G. Papadakis, G. Stamoulis, G. Argyriou, E. K. Taniskidou, E. Thanos, G. Giannakopoulos, L.Tsekouras, E. Koubarakis, "GeoSensor: Semantifying Change and Event Detection over Big Data", SAC 2019, Limassol, Cyprus 📖.
  5. N. Pittaras, F.Markatopoulou, V.Mezaris, I.Patras, "Comparison of Fine-tuning and Extension Strategies for Deep Convolutional Neural Networks", 23rd International Conference on Multimedia Modeling, Reykjavik, Iceland, Jan 2017 📖.

- **Book chapters**:
  1. N. Pittaras, S. Montanelli, G. Giannakopoulos, A. Ferrara, V. Karkaletsis, "Crowdsourcing in Single-document Summary Evaluation: the Argo Way", Multilingual Text Analysis: Challenges, Models & Approaches, World Scientific Publishers, 2020 📖.
  2. G. Giannakopoulos, G. Kiomourtzis, N. Pittaras, V. Karkaletsis, "Scaling and semantically enriching language-agnostic summarization", Trends and Applications of Text Summarization Techniques, 2019 📖.

SKILLS 🔧 💬

- programming: python, java, LaTeX, bash, C, C++, Matlab; various IDEs / SDKs
- ml: pytorch, sklearn, huggingface, tensorflow, opencv, pettingzoo, gym, sb3, ml-agents, captum, caffee, weka
- mlops / frameworks: pt-lightning, keras, docker, mlfow, dvc, wandb, clearml, ray/tune, tensorboard, grafana
- backend: cassandra, spark, mysql, postgres, influxdb, elasticsearch, GCP, mongo, sparql
- web, docs, teams: html, tomcat, hugo, flask, restx, Jira, Trello, Slack, clickUp, Confluence, sphinx
- other: linux 🐧, git, maven, django, pdb, blender, godot, colab, gradescope, airtable, RDF, owl
- languages : Greek (Mother tongue), English (Fluent, Cambridge CPE), German (Basic)
- misc: trained lifeguard, licensed to drive cars and speedboats.

HOBBIES / INTERESTS 🏀 🎵

- Long distance running, cycling, swimming, video games & indie gamedev, popular science (math, physics).
- Musical instruments (guitar, piano, bass, ocarina), singing, song writing, recording.