Nikos Kanakaris

Curriculum Vitae

Personal details

Birth	August 17, 1993
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Short bio

- Currently: Data Scientist at e-food.gr - Delivery Hero (R&D in the Data-Tech team, collaborating with mathematicians, business stakeholders and other computer scientists).
- Ph.D. in machine learning, graph mining, natural language processing and representation learning. BSc. in Computer Science.
- Experience both in academia and industry.
- Experience in research, end-to-end machine learning projects, full-stack software development and deployment.

Professional experience

Data Scientist *January 2023 - present*

efood - Delivery Hero, Full-time

Topic: Designing and implementing an ML model for price range prediction for restaurants.
Topic: Designing and implementing a product taxonomy and tagging model using multi-label and multi-task learning techniques.
Topic: Designing and implementing an in-house product annotation tool.
Technologies: Big Data, Structured and Unstructured data, PyTorch, LightGBM, sklearn, pandas, MLflow, Apache Airflow, BigQuery, Python, Ray, Multi-label classification, Seq2Seq models, Ranking, A/B testing, Streamlit, Optuna, Word embeddings, fasttext, SQL

Machine Learning Researcher *December 2017 - present*

University of Patras, Full-time

Topic: Designing and implementing a novel machine learning pipeline for detecting fake news campaigns using graph convolutional networks for the Astroturfing.gr research project. In collaboration with the Harokopio University of Athens (HUA)
Topic: Designing and implementing the data analysis pipeline, node classification, node clustering and node representation learning models for the inPOINT research project
Topic: Designing and implementing the collaboration and discourse analysis environment for OpenBioC research project
Topic: Working on an information system that monitors smart devices on cruise ships to provide maximum energy savings. ECLiPSe research project
Topic: Implementing the personalization and user profiling algorithms for MyCorridor European research project
Technologies: Data engineering and data science, crawling twitter data, PyTorch, PyTorch Geometric, text classification, graph classification, representation learning, word embeddings,

deep learning, data science, TensorFlow, Node.js, Natural Language Processing (NLP), cluster analysis, discourse analysis, Python, C++, PostgreSQL, MongoDB, Graph Mining, Docker, FastAPI, MongoDB, Neo4j

Senior AI Engineer *January 2019 - September 2019*

Mission-X, Full-time

Topic: Contributing to the design and implementation of the back-end system of the AI service as well as the database schema of the platform

Topic: Designing and calculating metrics and indices of the platform, including the 'value for money' metric, the 'chance of success' metric, the 'employee performance' index, the 'work balance team' index, the 'relevance of employee' and the 'allocation balance' index

Topic: Designing and implementing algorithms for prediction and automation, including automated prioritization of tasks (both for a team and each individual) based on dependency graphs and importance indices, prediction of the total project duration, provision of team insights (e.g. number of action items per user, equal distribution, average difficulty, past vs future workload), identification of highly dependent and critical tasks

Technologies: Docker, Python, Flask, Google App Engine, Google Cloud Platform, MongoDB, scikit-learn, Machine Learning, NLP, NLTK, NetworkX

Software Engineer *February 2016 - August 2017*

Programize LLC, Full-time

Topic: Converting an already existing financial model from Microsoft Excel to Python

Topic: Contributing to the automization of the process to convert Microsoft excel workbooks to Python

Topic: Implementing the back-end system for Litta mobile application

Topic: Implementing the main mobile hybrid and back-end application for Global Showcases

Topic: Adding responsive functionality to the official website for VForVacation

Topic: Contributing to the front-end and back-end internal financial application for SunPower

Topic: Implementing an Internet Explorer extension for OnionID

Technologies: Docker, Python, JavaScript, C#, C++, AngularJS, Flask, Node.js, PostgreSQL, Apache Cordova, MySQL, BHO IE, scipy, py2exe

Junior Software Engineer *November 2015 - May 2016*

Software Competitiveness International S.A. (SoftCom International), Full-time

Working for a German Automotive Industry under an NDA, area: Navigation

Topic: Implementing the middleware component that facilitates the front-end and back-end software layers

Technologies: C++, Python, Lua, XML

Tools and Standards: GIT, Jira, MISRA, Cmake, ISO 9001, ISO 27001

Junior Software Engineer *July 2015 - October 2015*

Software Competitiveness International S.A. (SoftCom International), Internship

Working for a Space Industry under an NDA, area: preventive performance monitoring

Topic: Researching for an alternative algorithm for hierarchical clustering

Technologies: C++, Java, machine learning techniques, data clustering

Freelance Personal Projects

Caper Co. *June 2017 - present*

Subject: Commercial system

Topic: Designing and implementing the back-end, the front-end and the CMS system for Caper Co., Caper Co. B2B, Food Caper Co. and Food Caper Co. B2B

Topic: Performing statistical analyses to identify and engage candidate customers
Topic: Building machine learning models to perform demand forecasting
Technologies: Angular.io, React.js, Svelte, Material Design, Django, Django REST framework, FastAPI, PostgreSQL, Docker, Braintree and myPOS payments, TensorFlow, Keras, scikit-learn

Education

Ph.D. Mechanical Engineering & Aeronautics *February 2018 - July 2023*
University of Patras

Laboratory: Industrial Management and Information Systems
Specialization: Graph Mining, Natural Language Processing, Text Representations
Dissertation title: *Graph-based knowledge representation and extraction from unstructured textual data using machine learning algorithms*
Description: Exploiting techniques and methods from the fields of graph theory, graph mining, natural language processing, knowledge management and machine learning in order to improve graph-based text representation and graph-based natural language processing. Advancing common natural language processing tasks, such as text classification, feature extraction, feature selection and representation learning, using graph-based text representations, word embeddings, and graph neural networks.
Dissertation Technologies: PyTorch, PyTorch Geometric, Python, Neo4j, TensorFlow, Keras, scikit-learn, pandas
Keywords: Graph mining, representation learning, word embeddings, text representations, text classification, graph neural networks, evaluation and deployment of ML models, data analysis
Other activities: **Activity 1.** Worked on one EU-funded and four national research projects as a researcher where I designed, developed and deployed machine learning models and knowledge management systems. **Activity 2.** Collaborating with industrial companies under an NDA to analyze real-world data, perform market basket analysis and extract insights. **Activity 3.** Teaching assistant. **Activity 4.** Writing proposals and project deliverables. **Activity 5.** Supervision of eight undergraduate and graduate students.
Supervisor: Nikos Karacapilidis

BSc. Informatics & Telematics *September 2011 - June 2016*
Harokopio University of Athens (8.5/10, valedictorian)

Specialization: Computer Software & Systems
Thesis: *Parallelization of "burn scar mapping" algorithms - Παραλληλοποίηση αλγορίθμων χαρτογράφησης καμένων εκτάσεων σε δορυφορικά δεδομένα* [Thesis] [Presentation]
Thesis Technologies: Digital Image Processing, Parallel Programming, Python, MPI
Supervisor: Dimitrios Michail

Skills

Languages: Greek (native), English (fluent)

Programming Languages: C/C++, Python/Cython, JavaScript/Node.js/TypeScript, Julia, Java, SQL, LaTeX

Databases: PostgreSQL, MySQL, SQLite, Neo4j, MongoDB, BigQuery

Computer Science: Machine Learning, Natural Language Processing, Graph Mining, Graph Theory, Recommender Systems, Digital Image Processing, Parallel

Programming, Embedded Systems

Technologies/Tools/Platforms: PyTorch, PyTorch Geometric, TensorFlow, Keras, scikit-learn, Pandas, Docker, Git, NGINX, MLFlow, Optuna

Other: Autodesk Fusion 360, 3D printing, Electronics

Interests

natural language processing, graph mining, graph-based text representations, graph neural networks, machine learning, business intelligence, AI-guided project management, graph theory, algorithms, parallel programming, embedded systems, IoT

Other Activities

Manuscript/Book Reviewer @ Manning Publications:

- Go Web Programming, Second Edition by Sau Sheong Chang
- Julia for Data Analysis by Bogumił Kamiński
- Julia as a Second Language by Erik Engheim
- Deep Learning with Python, Second Edition by François Chollet
- Real-World Natural Language Processing by Masato Hagiwara
- TensorFlow 2.0 in Action by Thushan Ganegedara
- Transfer Learning for Natural Language Processing by Paul Azunre
- Machine Learning for Business by Doug Hudgeon and Richard Nichol
- Succeeding with AI by Veljko Krunic

Reviewer: Artificial Intelligence Review Journal (AIRE), Project Management Journal (PMJ), Applied Sciences MDPI, Information MDPI, Atmosphere MDPI, PLOS ONE, Electronics MDPI

Teaching assistant: Semester course 'Computer Programming' at the Department of Mechanical Engineering and Aeronautics, University of Patras, Greece (academic years: 2018, 2019, 2020)

Publications

1. N. Kanakaris, I. Siachos and N. Karacapilidis: Is it a bug or a feature? Identifying software bugs using graph attention networks. International Conference on Tools with Artificial Intelligence (ICTAI), 2022. (to appear)
2. N. Kanakaris and N. Karacapilidis: Predicting prices of Airbnb listings via Graph Neural Networks and Document Embeddings: The case of the island of Santorini. International Conference on ENTERprise Information Systems (CENTERIS), 2022. (to appear)
3. N. Kanakaris, D. Michail and I. Varlamis: A comparative survey of graph databases and software for social network analytics: The link prediction perspective. Book chapter for Graph Databases and their use in social media and smart cities, Science Publishers and CRC Press, Taylor & Francis Group, 2022. (to appear)

4. D. Michail, N. Kanakaris and I. Varlamis: Detection of fake news campaigns using graph convolutional networks. International Journal of Information Management Data Insights. 2, 100104, 2022. (link)
5. N. Kanakaris, N. Giarelis, I. Siachos and N. Karacapilidis: Making personnel selection smarter through word embeddings: A graph-based approach. Machine Learning with Applications, 100214, 2021, doi: 10.1016/j.mlwa.2021.100214. (link)
6. A. Kanterakis, N. Kanakaris, M. Koutoulakis, K. Pitianou, N. Karacapilidis, L. Koumakis and G. Potamias: Converting Biomedical Text Annotated Resources into FAIR Research Objects with an Open Science Platform. Applied Sciences, Vol. 11, No 20, 9648, 2021, doi: 10.3390/app11209648. (link)
7. N. Kanakaris, N. Giarelis, I. Siachos and N. Karacapilidis: Shall I Work with Them? A Knowledge Graph-Based Approach for Predicting Future Research Collaborations. Entropy, Vol. 23, No 6, 664, 2021, doi: 10.3390/e23060664. (link)
8. N. Giarelis, N. Kanakaris and N. Karacapilidis: Medical Knowledge Graphs in the Discovery of Future Research Collaborations. In: Chee-Peng Lim, Ashlesha Vaidya, Kiran Jain, Virag U Mahorkar, Lakhmi C. Jain (eds.), Handbook of Artificial Intelligence in Healthcare. Springer, 2021 (link).
9. N. Giarelis, N. Kanakaris and N. Karacapilidis: A comparative assessment of state-of-the-art methods for multilingual unsupervised keyphrase extraction. In: I. Maglogiannis, J. Macintyre and L. Iliadis (eds.), Proceedings of the 17th International Conference on Artificial Intelligence Applications and Innovations (AIAI 2021), Crete, Greece, June 25-27, 2021, IFIP Advances in Information and Communication Technology, Vol. 627, pp. 635-645, doi: 10.1007/978-3-030-79150-6_50.
10. N. Giarelis, N. Kanakaris and N. Karacapilidis: On the utilization of structural and textual information of a scientific knowledge graph to discover future research collaborations: a link prediction perspective. In: A. Appice, G. Tsoumakas, Y. Manolopoulos and S. Matwin (eds.), Proceedings of the 23rd International Conference on Discovery Science (DS 2020), Online Conference, October 19-21, 2020, Springer, Cham, Switzerland, Lecture Notes in Artificial Intelligence, Vol. 12323, pp. 437-450, doi: 10.1007/978-3-030-61527-7_29. (link)
11. N. Giarelis, N. Kanakaris and N. Karacapilidis: An innovative graph-based approach to advance feature selection from multiple textual documents. In: Maglogiannis I., Iliadis L., Pimenidis E. (eds), Artificial Intelligence Applications and Innovations - Proceedings of the 16th International Conference on Artificial Intelligence Applications and Innovations (AIAI 2020), Halkidiki, Greece, June 5-7, 2020, Springer, Cham, IFIP Advances in Information and Communication Technology, Vol 583, pp. 96-106, doi: 10.1007/978-3-030-49161-1_9. (link)
12. N. Giarelis, N. Kanakaris and N. Karacapilidis: On a novel representation of multiple textual documents in a single graph. In: I. Czarnowski, R.J. Howlett and L.C.Jain (eds.), Intelligent Decision Technologies - Proceedings of the 12th KES International Conference on Intelligent Decision Technologies (KES-IDT 2020), Split, Croatia, June 17-19, 2020, Springer, Singapore, Smart Innovation, Systems and Technologies, Vol. 193, pp. 105-115, doi: 10.1007/978-981-15-5925-9_9. (link)
13. N. Kanakaris, N. Karacapilidis and G. Kournetas: On the exploitation of textual descriptions for a better-informed task assignment process. In: Proceedings of the 9th International Conference on Operations Research and Enterprise Systems (ICORES 2020), Valletta, Malta, February 22-24, 2020, Science and Technology Publications, pp. 304-310, DOI: 10.5220/0009151603040310. (link)
14. N. Kanakaris, N. Karacapilidis, G. Kournetas and A. Lazanas: Combining Machine Learning and Operations Research Methods to Advance the Project Management Practice. In: Parlier G., Liberatore F., Demange M. (eds), Operations Research and Enterprise

Systems. Communications in Computer and Information Science, Vol. 1162. Springer, Cham, 2020, pp. 135-155, DOI: 10.1007/978-3-030-37584-3_7. (link)
15. A. Kanterakis, G. Iatraki, K. Pityanou, L. Koumakis, N. Kanakaris, N. Karacapilidis and G. Potamias: Towards Reproducible Bioinformatics: The OpenBio-C Scientific Workflow Environment. In: Proceedings of the 19th IEEE International Conference on Bioinformatics and Bioengineering (BIBE 2019), Athens, Greece, October 28-30, 2019, pp. 221-226. (link)
16. N. Kanakaris, N. Karacapilidis and A. Lazanas: On the advancement of Project Management through a flexible integration of Machine Learning and Operations Research tools. In: Proceedings of the 8th International Conference on Operations Research and Enterprise Systems (ICORES 2019), Prague, Czech Republic, February 19-21, 2019, Science and Technology Publications, pp. 362-369, DOI: 10.5220/0007387103620369. (link)