Davor Vukadin

Date of birth: 07/08/1996 | **Nationality:** Croatian | **Phone number:** (+385) 913093059 (Work) |

Email address: davor.vukadin@fer.hr | **Website:**

https://scholar.google.com/citations?user=Cud3BiMAAAAJ | **Website:**

https://orcid.org/0000-0003-3309-6718 | **Website:** https://github.com/davor10105/ |

Address: Katanciceva 19a, 10430, Samobor, Croatia (Home)

ABOUT ME

I hold a Ph.D. in Computer Science from the University of Electrical Engineering and Computing in Zagreb, specializing in Explainable AI. My research focuses on layer-wise relevance propagation, local attribution evaluation, human-XAI alignment, and leveraging XAI for efficient model learning. Beyond academia, I have extensive industry experience applying machine learning across computer vision, natural language processing, graph processing, and time-series forecasting.

WORK EXPERIENCE

FACULTY OF ELECTRICAL ENGINEERING AND COMPUTING – ZAGREB, CROATIA

RESEARCHER – 18/09/2024 – CURRENT

Researching attribution methods in explainable AI, developing metrics to evaluate these methods, and exploring approaches to assess the alignment between metrics and human perception.
Exploring attribution alignment strategies using LLM attributions for few-shot tabular learning in smaller models.

KVIKI MIC - SELF-EMPLOYED – ZAGREB, CROATIA

AI ENGINEER – 01/11/2020 – CURRENT

Ongoing/completed projects:

- dynamic multi-agent framework for company market and sales positioning research.
- multi-agent sales assistant and customer support for online shopping platforms
- transformer-based chatbot for the Ministry of Justice and Public Administration in Croatia
- semantic search engine for the Ministry of Justice and Public Administration in Croatia to enable acquiring relevant information from a large set of unstructured documents
- explainable sequence classification model for the European Commission used to classify the innovative properties of a tender
- modelling and training several detection models for insulator detection on high-voltage transmission lines from drone image data
- modelling and training several models for telecommunication transmission alarms and data prediction (time-series forecasting) using graph neural networks and transformer architectures
- creating educational material about deep learning for object detection, segmentation and classification

Technologies used: LangChain, transformers, PyTorch, Tensorflow, OpenCV, Docker, FastAPI, Svelte

IOLAP – RIJEKA, CROATIA

SENIOR AI ENGINEER – 29/01/2024 – 17/09/2024

Evaluating various aspects of LLM performance in a RAG / tool use setting using custom criteria defined in natural language.
Implementing a monitoring system to track LLM drift.
Implementing an automated training procedure for LLMs to mitigate model drift.
Mentoring a class of students as a part of the Elixirr Digital summer academy as well as creating an entire course in NLP, LLM and LangChain

SCANDOC AI D.O.O. – ZAGREB, CROATIA

DATA SCIENTIST – 01/07/2022 – 29/01/2024

Modelled several transformer-based models for information extraction from identity documents - optical character recognition, text detection, document segmentation and rotation classification.
Optimized models for deployment using ONNX.

Created a mobile app in Flutter that connected all of the aforementioned components.
Implemented a face recognition system that connected users to their respective identity documents.
Fine-tuned several large language models for text and sequence classification in the domain of job description processing.

Technologies used: PyTorch, OpenCV, scikit-learn, Flutter, ONNX

FACULTY OF ELECTRICAL ENGINEERING AND COMPUTING – ZAGREB, CROATIA

RESEARCHER – 01/08/2020 – 01/07/2022

Researching explainable AI and bug prediction in software code.
Developed a novel method of extracting explanations from the Transformer architecture, alongside a new evaluation method for attribution methods.
Used LangChain to query LLMs as a substitute for human feedback in evaluating text-based explanations.

Teaching assistant on several courses:

- Analysis of Massive Datasets
- Introduction to Theoretical Computer Science
- Programming Language Translation
- Networked Systems Middleware

Technologies used: LangChain, transformers, PyTorch, Django, Docker, Flask

DATABLAST D.O.O. – ZAGREB, CROATIA

JUNIOR DATA SCIENTIST – 01/10/2019 – 01/07/2022

Implemented models used for resume parsing and information extraction.
Implemented a user to job matching module based on collaborative learning.
Implemented a series of models used for identity document, driver's licence and passport parsing from real world images.
Performed a case study of several models used for time-series forecasting on Croatian electricity transmission system operator data.

Technologies used: Tensorflow, PyTorch, OpenCV, scikit-learn

TAKELAB FER – ZAGREB, CROATIA

RESEARCH INTERN – 01/08/2019 – 01/11/2019

Project: NLP News Crawler
Crawling different news portals and scraping their content
Processing scraped items with different NLP methods in order to collect higher level information and presenting that information to the user

Technologies used: scikit-learn, gensim, scrapy

ERICSSON NIKOLA TESLA D.D. – ZAGREB, CROATIA

RESEARCH INTERN – 01/07/2019 – 30/09/2019

Project: Explainable AI
Programming a robotic arm in Arduino and having it recognize certain objects using deep neural networks written in Tensorflow
Introducing adversarial examples and explaining the reasoning behind failed classification

Technologies used: Tensorflow, Arduino

COMBIS D.O.O. – ZAGREB, CROATIA

JUNIOR PYTHON DEVELOPER – 01/07/2018 – 30/09/2018

Writing Python scripts for managing firewall rules and Active Directory users and their permissions by using Ansible
Full-stack web application development - interface for running above-mentioned scripts, made in Python with Django

Technologies used: Django, Ansible, JavaScript

EDUCATION AND TRAINING

01/10/2020 – 08/11/2024 Zagreb, Croatia

DOCTOR OF PHILOSOPHY - PHD, COMPUTER SCIENCE Faculty of Electrical Engineering and Computing

Address Unska 3, 10000, Zagreb, Croatia | **Thesis** Deep Learning Model Interpretability by Evaluating Relevance Maps

01/10/2018 – 01/07/2020 Zagreb, Croatia

MASTER'S DEGREE, COMPUTER SCIENCE Faculty of Electrical Engineering and Computing

Address Unska 3, 10000, Zagreb, Croatia | **Final grade** 4.95 | **Type of credits** Summa cum Laude |

Thesis Information Extraction from Free-Form CV Documents in Multiple Languages

01/10/2015 – 01/07/2018 Zagreb, Croatia

BACHELOR'S DEGREE, COMPUTER SCIENCE Faculty of Electrical Engineering and Computing

Address Unska ulica 3, 10000, Zagreb, Croatia |

Thesis Classification of Breast Tumors Using Deep Convolutional Neural Networks

PUBLICATIONS *(The first three publications are especially relevant to this application)*

2024

Advancing Attribution-Based Neural Network Explainability through Relative Absolute Magnitude Layer-Wise Relevance Propagation and Multi-Component Evaluation

D Vukadin, P Afrić, M Šilić, G Delač, 2024, ACM Transactions on Intelligent Systems and Technology 15 (3), 1-30

2024

Evaluating Harmony: Neural Network Explanation Metrics and Human Perception

D Vukadin, M Šilić, G Delač, K Vladimir, 2024 47th MIPRO ICT and Electronics Convention (MIPRO), 7-12

2025

Large Language Models as Attribution Regularizers for Efficient Model Training

D Vukadin, M Šilić, G Delač, 2025 The 3rd World Conference on eXplainable Artificial Intelligence (Will be published in September 2025)

2021

Information extraction from free-form CV documents in multiple languages

D Vukadin, AS Kurdija, G Delač, M Šilić, 2021, IEEE access 9, 84559-84575

2023

Empirical study: How issue classification influences software defect prediction

P Afric, D Vukadin, M Silic, G Delac, 2023, IEEE access 11, 11732-11748

VOLUNTEERING

01/01/2025 – CURRENT Rijeka

STEM Workshop Facilitator in the Association Center for the Culture of Dialogue

Designing and leading educational workshops for low-income children, focusing on programming, game development, graphic design, and artificial intelligence