# Gjorgji Madjarov

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## Personal Information
Citizenship          Macedonia
Languages (fluent)    English and Macedonian (native)

## Professional Experience

### December 2021 – now
**Professor**
**June 2017 – December 2021**
**Associate professor**
**September 2012 – June 2017**
**Assistant professor**
Faculty of Computer Science and Engineering,
University Ss. Cyril and Methodius, Skopje, Macedonia

**Graduate courses:**
Decision support systems and Time series analysis and prediction, Mining massive datasets
**Undergraduate courses:**
Introduction to Informatics, Introduction to Internet, Object-oriented programming, Advanced programming, Visual programming, Software engineering, Sowtfare Quality and Testing, and Pattern recognition
**Research and applications:**
Analyzing text sentiment using deep learning.
Large scale text classification using state-of-the-art techniques.
Automatic  image captioning and visual storytelling
Image classification using state-of-the-art techniques.
Recommendation techniques using model-based approaches.
Designing and developing algorithms for multi-label and hierarchical multi-label learning.
Designing and developing algorithms for structured output prediction.

### September 2018 – now
**Co-founder – Elevate Global**, Skopje, Macedonia
Adaptive data stream analytics, anomaly, and outlier detection in massive data streams
Time series data processing, storing and analysis
Machine learning and batch processing
Multivariate time series modeling and forecasting for the energy and telecom industry

## January 2017 – now
**Aritficial Inteligence Advisor –** [Netcetera](), Zurich, Switzerland
   Working on fraud detection and automatic text classification and paragraph tagging
   Anomaly detection and local classification for fraud detection in health insurance
   Large scale document classification and document similarity measuring
   Cancer classification from DNA methylation

## March 2021 – now
**Aritficial Inteligence Advisor –** [gMendel](), Copenhagen, Denmark
   Working on real-time detection of chromosomal aberrations using long-read
   DNA sequencing and state-of-the-art machine learning

## October 2021 – November 2021
**Research visit** to Distributed and Operating Systems Department at [TU Berlin](), Berlin, Germany
   Working on distributed log anomaly detection and intelligent infrastructure management

## September 2007 – August 2012
**Teaching and research assistant** - [Faculty of Computer Science and Engineering](),
University Ss. Cyril and Methodius, Skopje, Macedonia
   **Undergraduate courses:**
   Structured Programming, Object Oriented Programming, Visual Programming and Software Engineering.
   **Research and applications:**
   Developed algorithms for multi-class classification.
   Researched on semi-supervised and supervised learning.
   Performed structured output prediction and time series prediction.

## October 2010 – September 2011
**Research visit** to the knowledge technologies department at [Joseph Stefan Institute](), Ljubljana, Slovenia

## June 2007 – October 2007
**Software developer** in [Netcetera]() - Skopje, Macedonia.
   **Applications:**
   Worked on real estate enterprise information system (business logic part).
   Automated generations of unit tests.
   Developed an extension of Apache Struts.
   Worked with Hibernate ORM.

# Education

**May 2012: Doctor of Philosophy (PhD)** in Computer Science
Institute of Software Engineering, Faculty of Computer Science and Engineering,
University Ss. Cyril and Methodius, Skopje, Macedonia
> **Dissertation:** Advanced methods for hierarchical multi-label learning
> **Area:** Machine Learning, artificial intelligence
> **Mentor:** [Dejan Gjorgjevikj](#), **Co-mentor:** [Saso Dzeroski](#)

**August 2009: Master of Science (MSc)** in Computer Science (average degree 10.00)
Department of Computer Science and Engineering, Faculty of Electrical Engineering and Information
Technology, University Ss. Cyril and Methodius, Skopje, Macedonia
> **Thesis:** Multi-class classification utilizing SVMs in Binary Tree Architecture
> **Area:** Machine Learning, artificial intelligence

**June 2007**: **Engineer's degree** in Electrical Engineering (average degree 10.00)
Faculty of Electrical Engineering and Information Technology, University Ss. Cyril and Methodius,
Skopje, Macedonia

# Applied R&D

**Latency-bound adaptive data stream analytics**
- Real-time data-stream analytics, anomaly detection and alerting
- Unified management and predictive analytics of heterogeneous data
- Intelligent infrastructure management and distributed log anomaly detection

**MLOps for time-series analysis, modelling, and forecasting**
- Managing hundereds of different models in production and staging, both in batch and stream inference scenario

**Semantic serach and automated tagging of milions of medical documents**
> Managing hundereds of different models in production and staging, both in batch and stream inference scenario

**Batch analytics platform for time series data**
- Building and managing predictive models and optimization
- Day-ahead energy price prediction
- Real-time energy consumption and energy production forecasting

**Real-time detection of chromosomal aberrations using long-read DNA sequencing**
- Sequence aligment
- DNA modeling using deep learning
- Transfer learning

**Sensor based health status prediction**
- AI engine for patient health status prediction and diagnostics based on diverse sensor data

**Real-estate property valuation**

- Running and maintenance costs forecasting and property valuation for a real-estate company

**Machine Learning Powered Risk Classification System for Detection of Waste, Abuse and Fraud in Health Insurance Claims**
- Claim processing and claim fraud detection
- Perform rich analytics based on behaviour analysis
- Perform explainable claims processing
- Adapt to new procedures and practices for WAF.
- Minimize waste, abuse and fraud

**Log anomaly detection in distributed systems using graph modelling**

**Universal cancer detection using epigenetics factors**

**Twitter Sentiment Analysis and Emotion Identification using Deep Learning**

**Automatic Image Captioning and Visual Storytelling**

**Automatic Legal Document Anomaly Detection using Deep Learning and Data-driven Approaches**

# Research

I have published more than 60 papers on International conferences and SCI Journals
The paper "An extensive experimental comparison of methods for multi-label learning" published in Pattern Recognition 2012 (ranked as 7$^{th}$ journal in Computer Vision and Pattern Recognition category by Scopus) was the third most cited paper from 2012 to 2017 from Pattern Recognition Journal
Our team won on the SemEval 2016 competition on the task 4, subtask D (results, paper)
I served as a local organization on ECML PKDD 2017 that was held in Skopje in 2017

## R&D

Patient health status prediction and diagnostics based on sensor data and machine learning – Bilateral Macedonia - Slovenia (coordinator)
Learning from Massive, Incompletely annotated, and Structured Data - Framework Program 7 funded (participant)
EuroCC – Horizon 2020 (participant)
Content based Image Retrieval System for Large Medical Image Corpus
Designing and Developing Algorithms for Multi-label and Hierarchical Multi-label Learning.
Designing and Developing Algorithms for Structured Output Prediction.

## Conference chair
ICT Innovations 2019
International Conference on Informatics and Information Technologies 2015

## Program committee member
European Conference on Machine Learning / Principles and Practice of Knowledge
Discovery in Databases (ECML/PKDD)
Discovery Science
International KEYSTONE Conference
ICT Innovations
ETAI

## Reviewing
**Journals:** Machine Learning, Information Sciences, Pattern Recognition, Data Mining and
Knowledge Discovery, Neurocomputing, IEEE Transactions on Neural Networks and Learning
Systems, Computational Intelligence, International Journal of Pattern Recognition and Artificial
Intelligence, International Journal of Artificial Intelligence Computing and Informatics,
Information processing letters

**Conferences:** European Conference on Machine Learning / Principles and Practice of Knowledge
Discovery in Databases (ECML/PKDD)
Discovery Science (DS)
International KEYSTONE Conference
ICT Innovations

## Citations
The number of citations is calculated on 25.05.2022
[GoogleScholar](#) 1845 (h-index: 16)

# Scholarships and awards
## Scholaships
**2010-2011** Erasmus Programme scholarship
**2002-2007** Macedonian's Ministry of Education scholarship

## Awards
**2022 - Best paper award** at the 19th International Conference on Informatics and Information
Technologies for the paper logs2graphs: Data-driven graph representation and visualization of log
data, co-authored with S. Andonov, V. Jovev, A. Kitanovski and A. Krsteski
**2015 - Best paper award** at the 16th International Conference on Intelligent Data Engineering
and Automated Learning (IDEAL-2015) for the paper Web genre classification via hierarchical
multi-label classification, co-authored with D. Kocev, V. Vidulin and I. Dimitrovski
**2007 - Graduated with Honours** - BSc. Eng., Degree, Electrical Engineering and Information
Technology, University Ss. Cyril and Methodius, Skopje, Macedonia

**2007 - Award "Инженерски прстен" (Engineering ring)** - Engineering Institution of Macedonia. The best student of generation 2006/2007

**2007 - Award "Златник" (Gold coin)** - University Ss. Cyril and Methodius, Macedonia. The best student of generation 2006/2007

**2002 – 2007** Diploma for finishing each study year with high grade-point average at the Faculty of Electrical engineering, Skopje, Macedonia