

Curriculum Vitae: Karlo Babić

CONTACT INFORMATION	University of Rijeka Faculty of Informatics and Digital Technologies Radmile Matejčić 2 HR-51000, Rijeka Croatia	<i>phone:</i> +385 51 584-718 <i>mail:</i> karlo.babic@inf.uniri.hr <i>web:</i> www.inf.uniri.hr
	Researcher ID ORCID	E-5801-2019 https://orcid.org/0000-0001-6343-0938
EDUCATION	<p>PhD, Information Science, University of Rijeka, Faculty of Informatics and Digital Technologies, 2018-present.</p> <p>M.Sc., Informatics, University of Rijeka, Faculty of Informatics and Digital Technologies, 2016-2018.</p> <p>Thesis Topic: <i>Visualization of learning algorithms of neural networks</i>. Supervisor: Ana Meštrović.</p> <p>B.E., Informatics, University of Rijeka, Faculty of Informatics and Digital Technologies, 2013-2016.</p> <p>Thesis Topic: <i>Implementing the Solar System model using OpenGL library and C++ language</i>. Supervisor: Ana Meštrović.</p>	
LIFELONG LEARNING AND PROFESSIONAL SPECIALIZATION	<p>4th International School on Deep Learning Las Palmas de Gran Canaria, Spain 26-30 July 2021</p> <p>Workshop "Search tools for scientific sources" University of Rijeka, Rijeka, Croatia 9 April 2019</p> <p>Early Career Training Event COSTNET The Department of Statistics, Ludwig-Maximilians-University, Munich, Germany 11-13 February 2019</p>	
PROFESSIONAL POSITIONS	<p>Assistant Faculty of Informatics and Digital Technologies, University of Rijeka 2018 - present</p>	
RESEARCH INTERESTS	Machine learning, neural networks, simulations, natural language processing, representation learning	
RESEARCH PROJECTS	<p>Researcher</p> <ul style="list-style-type: none">• Multilayer Framework for the Information Spreading Characterization in Social Media during the COVID-19 Crisis (HRZZ InfoCoV) 2020 - 2022• Keyword Extraction and Summarization Based on Language Networks (LangNet), uniri-drustv-18-20 2019 - 2022• Methods for measuring semantic similarity of texts (SemTex), uniri-drustv-18-38 2019 - 2022	
PUBLICATIONS	<p>Journal publications</p> <p>Babić, Karlo, and Ana Meštrović. "Recursively Autoregressive Autoencoder for Pyramidal Text Representation." <i>IEEE Access</i> 12 (2024): 71361-71370.</p>	

Pitoski, Dino, Karlo Babić, and Ana Meštrović. "A new measure of node centrality on schedule-based space-time networks for the designation of spread potential." Scientific reports 13.1 (2023): 22561.

K. Babić, M. Petrović, S. Beliga, S. Martinčić-Ipšić, M. Matešić, A. Meštrović. "Characterisation of COVID-19-Related Tweets in the Croatian Language: Framework Based on the Cro-CoV-cseBERT Model." Applied Sciences, 2021, 11, 21.

K. Babić, F. Guerra, S. Martinčić-Ipšić, A. Meštrović. "A Comparison of Approaches for Measuring the Semantic Similarity of Short Texts Based on Word Embeddings." JIOS, 2020, 44, 2.

A. Vorkapić, K. Babić, R. Radonja, S. Martinčić-Ipšić. "Machine learning methods in monitoring operating behaviour of marine two-stroke diesel engine." Transport, 2020, 35, 5.

K. Babić, S. Martinčić-Ipšić, A. Meštrović. "Survey of Neural Text Representation Models." Information, 2020, 11, 511.

Conference proceedings

K. Babić, M. Petrović, S. Beliga, S. Martinčić-Ipšić, M. Pranjić, A. Meštrović. "Prediction of COVID-19 Related Information Spreading on Twitter." MIPRO, DS-BE, 2021, Opatija, Croatia, 2021, pp. 395-399.

K. Babić, M. Petrović, S. Beliga, S. Martinčić-Ipšić, A. Jarynowski, A. Meštrović. "COVID-19-Related Communication on Twitter: Analysis of the Croatian and Polish Attitudes." ICICT, London, England, 2021, pp. 379-390.

K. Babić, S. Martinčić-Ipšić, A. Meštrović, F. Guerra. "Short texts semantic similarity based on word embeddings." CECIIS, Varaždin, Croatia, 2019, pp. 27-33.

K. Babić, A. Meštrović. "Visualizations of the training process of neural networks." MIPRO, SP, 2019, Opatija, Croatia, 2019, pp. 1619-1623.

Talks

K. Babić, S. Martinčić-Ipšić. "The representation of text in a multilayer complex network for deep learning." 4th COSTNET Action conference, Bilbao, Spain, 9-11 September 2019. (Poster)

K. Babić. "The representation of text in a multilayer complex network for deep learning." Early Career Training Event COSTNET, the Department of Statistics, Ludwig-Maximilians-University, Munich, Germany, 11-13 February 2019.

K. Babić, A. Meštrović. "Neural networks visualizations." 10th International Conference on Information Technologies and Information Society, Novo Mesto, Slovenia, 24-26 October 2018.

TEACHING EXPERIENCE

Undergraduate courses

- Introduction to software engineering, FIDIT¹, University of Rijeka 2023
- Basics of game development, FIDIT, University of Rijeka 2022-2023
- Programming Paradigms and Languages, FIDIT, University of Rijeka 2021-
- Formal Languages and Compilers 2, FIDIT, University of Rijeka 2019-2020
- Declarative programming languages, FIDIT, University of Rijeka 2019-2022
- Formal Languages and Compilers 1, FIDIT, University of Rijeka 2018-2021

¹FIDIT - "Faculty of Informatics and Digital Technologies"

- Programming 1, Department of Polytechnics, University of Rijeka 2018-2019

Graduate courses

- 3D game development, FIDIT, University of Rijeka 2024-
- Data intelligence, FIDIT, University of Rijeka 2023-
- Big data analytics, FIDIT, University of Rijeka 2023-
- Programming for artificial intelligence, FIDIT, University of Rijeka 2023-
- Object-Oriented Languages, FIDIT, University of Rijeka 2021
- Natural Language Processing, FIDIT, University of Rijeka 2019-
- Decision Support Systems, FIDIT, University of Rijeka 2019-2022
- Management of IT Projects, FIDIT, University of Rijeka 2018-2021

TECHNICAL SKILLS

Operating Systems

GNU/Linux, MS Windows

Programming Languages

Advanced: Python, JavaScript

Intermediate: C++, C#, Java, Bash

Beginner: Haskell, PHP

Tools

L^AT_EX, TensorFlow/Keras, Godot, Unity

HOBBY PROJECTS

Simulations

Abstracted fluid, fluid flow on terrain, dynamics of falling flat object through air, pendulums, evolution tree generation, animated mathematics of chaos

Cellular automata

Game of life and modified versions, liquid automaton

Web scraping

Celestial events information, weather information, website crawler with audio and video scraping

Web

Simulations and games using JavaScript

Video games

For Web with JavaScript, and for mobile phones with Godot (Paperfall is on Google Play)

LANGUAGES

Fluent: Croatian, English