Michael **Sakevych**

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Education

Taras Shevchenko National University of Kyiv — *Kyiv, Ukraine*

COMPUTER SCIENCE AND CYBERNETICS DEPARTMENT — *Sep. 2019 - Present*

Bachelor of Science in Applied Mathematics

Johannes Kepler University — *Linz, Austria*

ARTIFICIAL INTELLIGENCE DEPARTMENT — *Mar. 2022 - Aug. 2023*

Bachelor of Science in Artificial Intelligence

Texas State University — *San Marcos, Texas*

COMPUTER SCIENCE DEPARTMENT — *Aug. 2023 - Present*

PhD in Computer Science

Skills

Languages Python, Golang, C, C++, C#, Maple, SQL, HTML/CSS, LaTeX

Tools Conda, PostgreSQL, Traefik, Redis, Swagger, Docker, Docker Compose, EVM, PyCharm, Jupyter Notebook, Matlab, Git, Bash

Libraries PyTorch, sklearn, Pandas, NumPy, Matplotlib, Horizon, Viper, Sentry, Chi, Logan, TeleBot, NetworkX, TokenD, PyGame

Experience

Software Engineer Intern @ Distributed Lab — *Kyiv, Ukraine*

GO, SWAGGER, POSTGRESQL, REDIS, VIPER, TRAEFIK, SENTRY, HORIZON, ETHEREUM, BLOCKCHAIN — *Dec. 2021 - Feb. 2022*

- Worked on TokenD project for constructing ready-to-use blockchain-oriented services deployable on different blockchains.
- Created a multi-purpose blob storage service written in Go, bootstrapped by OpenAPI, backed by PostgreSQL and Redis
- Set up micro-service deployment containerized by Docker, orchestrated by Docker Compose and monitored by Cop and Sentry

DIA and TA — *San Marcos, Texas*

TEACHING, C++, DATA STRUCTURES, CS BASICS, SYNTAX, HUMAN FACTORS — *Aug. 2023 - Present*

- Teach and grade undergraduate and master's level classes, covering introductory programming concepts in C++ for freshmen and grading assignments and presentations for a Human Factors class.

Projects

Monkey Interpreter

GO, COMPILER DESIGN, PROGRAMMING LANGUAGES

- Created a robust lexer, recursive-descend Pratt parser, AST-walking interpreter and REPL for the Monkey programming language.
- Implemented first-class support for the higher-order functions, recursion, tail call optimization, closures, namespaces, etc.
- Extended built-in functions to work with heterogeneous lists and closed-addressing hash tables as well as strings.
- Designed a standard library with wide variety of modules covering: buffered I/O, containers, mathematical functions, logging, etc.

Measuring embedding distortion using K-Nearest Neighbors Graphs

PYTHON, NETWORKX, PCA, SVD, PLOTLY, DIMENSIONALITY REDUCTION ALGORITHMS

- Suggested a method for evaluating the distortion in embeddings using distances in K-nn graph.
- Built distortion "heatmap" bi-linearly interpolating in the 2D space.
- Implemented interactive visualization of distortion factors (paths in graph).
- Authored a paper describing the method and comparing it to the state-of-art approaches. Publication pending.

Programming Assignment Bot

PYTHON, TELEGRAM API, ALGORITHMS, PLAGIARISM DETECTION

- Created chat bot that serves as a bridge between teachers and students, allowing teachers to set up a programming assignment.
- Students can send their solutions and check them against a teacher-defined test suit(including a check for plagiarism).
- Implemented state-of-the-art plagiarism detection algorithm: "MOSS, A System for Detecting Software Plagiarism. Aiken, Alex. (2002)."
- Added support for solutions targeting many different languages/compilers/toolchains.

Publications

BioDiffusion: A Versatile Diffusion Model for Biomedical Signal Synthesis

San Marcos, Texas

Coauthor *March 2024*

- We introduce BioDiffusion, a diffusion-based probabilistic model optimized for the synthesis of multivariate biomedical signals. This model is capable to generate new synthetic time-series signals which is at most need in small datasets, although crucial for increment of diversity

Analysis of Differences Between Time Tracking APIs

Linz, Austria

Author *March 2023*

- Track of high computation power utilising processes using bench-marking tools like $usr/bin/time$, $fish\ time$, $bash\ time$ and BenchExec with comparison of results.(Bachelor thesis)

Augmentation techniques for time series

San Marcos, Texas

Coauthor *May 2024*

- Analysis and application of various augmentation techniques on Time-Series Data: time-warping, space-warping, GAN, Diffusion Model, etc.

Extracurricular Activity

STEP IT Academy

Seattle, WA

LECTURER, VOLUNTEER *Aug. 2020 - Jun. 2021*

- Lectured 2 semester-long Computer Science classes for senior high-school kids focusing on Algorithms and Data Structures in C++.
- Taught graph algorithms, computational complexity, multithreading, x86 assembly, encoding, compression, BMP and AVI formats.

Austrian-Ukrainian Student Support Group

Linz, Austria

ORGANIZER *Mar. 2022 - Sep. 2022*

- Helped dislocated Ukrainian students to continue their studies at the JKU in Linz, curated a list of resources/guides. It became a news website.