Denis Kinyugo Maina

Machine Learning Researcher

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🌐 https://github.com/Kinyugo

in denis-kinyugo

Kinyugo

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WORK EXPERIENCE

Machine Learning Researcher
Self Employed

(Jul 2022 - Present)

Specialized in generative AI with a focus on developing efficient and high-quality neural synthesis models.

Achievements:

- Designed and developed Msanii, a leading-edge music synthesis model that delivers rich soundscapes with improved efficiency
- Released Msanii as open-source, increasing accessibility for researchers and developers globally
- Created interactive demos and integrated the model with Weights and Biases for improved experiment tracking and reproducibility
- Demonstrated proficiency in training and deploying machine learning models on cloud platforms

🔗 https://arxiv.org/abs/2301.06468

Bioinformatics Intern
ICIPE - International Centre of Insect Physiology and Ecology

(Feb 2022 - Jun 2022)

Worked on projects integrating computer science and biological sciences while interning at icipe.

Achievements:

- Led a team of three to develop efficient computational pipelines for pangenomic and phylogenetic analysis, resulting in a 50% improvement in quality and speed of analysis and increased user-friendliness
- Implemented data mining software to support large scale bioinformatics analysis
- Lead a team to reproduce a research work, presenting the findings and methods to benefit the scientific community
- Delivered presentations on the application of machine learning in biological sciences, inspiring other researchers to incorporate these methods into their workflows
- Designed and developed the bioinformatics department website, increasing department's outreach to a wider audience

🔗 http://www.icipe.org/

Software Developer
Authentic Sparrows

(May 2022 - Aug 2022)

Contributed to the research, design, and development of software supporting the company's main services.

Achievements:

- Created a fleet management system that significantly reduced operation costs
- Designed and developed the company's website, attracting new customers to the business
- Led a team of three to integrate a mobile application with the existing web app, enhancing asset management through easier accessibility

🔗 https://site.authenticsparrows.co.ke/

Dedan Kimathi University of Technology
Bachelor's degree, Computer Science

(Mar 2018 - Dec 2021)
Second Upper Division

I majored Artificial Intelligence, where I developed an AI system for transforming live action footage to animated video.

Thesis:

LiAn: A Deep Learning Approach For Creating Animation From Live Action

🔗 **https://www.dkut.ac.ke/**

Artificial Intelligence, Programming

PUBLICATIONS

Msanii: High Fidelity Music Synthesis on a Shoestring Budget
arXiv

(Jan 2023)

A publication that describes the development of a cutting-edge music synthesis model, Msanii.

Key Features of Msanii:

- Combines the expressiveness of mel spectrograms
- Incorporates the generative abilities of diffusion models
- Utilizes the vocoding capabilities of neural vocoders

Demonstration of Effectiveness:

- Synthesizes 190 seconds of high-fidelity stereo music at 44.1 kHz
- Does not rely on concatenative synthesis, cascading architectures, or compression techniques

🔗 **https://arxiv.org/abs/2301.06468**

PROJECTS

odewel
Neural Network Library for On-Demand Weights Loading

(Jan 2023 - Present)

Developed a tiny library called odewel that enables running any neural network model on any hardware. This library exploits the layered structure of neural networks and loads only the necessary weights for each layer to fit into the memory of everyday devices.

Responsibilities:

- Analyzed the limitations of existing solutions for on-device computation of neural networks
- Designed and implemented a library that takes advantage of the layered structure of neural networks
- Implemented techniques for efficient weight loading and pre-loading for improved speed
- Tested the library on various models and hardware configurations to ensure its functionality and performance

Outcome:

The library is capable of running large neural network models on devices with limited memory and computation resources, providing an accessible solution for the average user to experiment with these models. The project is still a work-in-progress with better performance improvements to be added in the future.

🔗 **https://github.com/Kinyugo/odewel**

REFERENCES

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