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Koome Derrick

Geospatial Analyst

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github.com/koome-dev
My Portfolio website

EDUCATION

The University of Nairobi, Kenya.

Bsc. Geospatial Engineering *August 2013*

Relevant Courses: Remote Sensing, Geographical Information Systems (GIS), Photogrammetry

SKILLS

***Programming Languages**:* SQL, Python

***Machine learning**:* familiar with the Scikit-Learn library and algorithms such as logistic regression, support vector machines, decision trees, random forests, k-fold cross validation, hyper-parameter tuning etc.

***Software's**:* Pycharm, Jupyter notebooks, QGIS(with GRASS), ArcGIS Online, Visual Studio Code, ArcGIS Pro

***Database**:* MySQL, PostGIS

Geospatial Analysis: familiar with geopython libraries such as Geopandas, Geopy, Plotly, Folium, Geemap and can perform spatial operations with ArcGIS Pro such as suitability modeling, prediction modeling, object detection and hotspot and outlier analyses. Can perform analyses with Google Earth Engine on both JavaScript and Python APIs. Currently learning deep learning application for earth observation to develop models that carry out image segmentation and classification, object detection, time series analysis, landslide detection and flood mapping.

Core Competencies: Writing – Co-author of an industry book ***"Project Design for Geomatic Surveyors and Engineers"*** which is available for sale on **Amazon.**

PROJECT EXPERIENCE

January 2024 – February 2024

Machine learning project with deployment: American President OpenCV Classification

Developed a machine learning image classification project to detect and classify images of nine U.S. presidents using Python, OpenCV, and PyWavelet. Collected and preprocessed 1,350 images, applied hyperparameter tuning with GridSearchCV to compare SVM, Random Forest, and Logistic Regression, selecting SVC for optimal performance. Deployed the model with Streamlit for a user-friendly interface, enabling users to identify presidents from uploaded images.

March 2024

Global warming Geospatial Analysis

Analyzed over 200 years (1750–2020) of global average temperature data to uncover long-term trends. Leveraged Python and the Pandas library to efficiently process and extract relevant insights from the dataset. Created compelling visualizations, including line charts, choropleth maps, and geographic heat maps, to illustrate the clear correlation between rising global temperatures and industrialization. This analysis effectively communicated the impact of human activity on climate change, presenting complex data in an accessible and visually engaging manner.

April 2024

Covid 19 Geospatial Analysis

Analyzed global COVID-19 data from the pandemic's onset to February 2022, including confirmed, recovered, and death cases. Utilized animated choropleth maps and geographic scatter plots to visualize the spread and recovery rates over time. Additionally, employed markers and marker clusters to highlight cumulative deaths by country, effectively conveying critical trends and insights through diverse and engaging visualizations.

August 2024

Suitability Modelling of Carbon-Neutral Headquarters

With the use of ArcGIS Pro Spatial Analyst license, we chose a location for a corporate headquarters with minimal carbon footprint using the following criteria; a location that reduces construction cost and is easily accessible by employees; an optimal location to incorporate renewable energy devices; a location that is accessible to various amenities; and a location that will minimally disrupt critical environmental areas and corridors.

September 2024

Deep Learning Object Detection

I leveraged ArcGIS Pro's deep learning tools to perform object detection, identifying swimming pools in a defined area to support accurate property assessments. By automating the detection process, tax assessors would identify unrecorded pools that impacted property values and taxes. This approach enhanced the accuracy of tax records, ensuring fair assessments and generating additional revenue for the community.

October 2024

Hotspot and Outlier Analysis

I applied hotspot and outlier analysis to uncover meaningful patterns in SNAP (Supplemental Nutrition Assistance Program) participation, identifying regions with high participation requiring sustained resources and low participation needing targeted outreach. Hotspot analysis revealed geographic clusters, while outlier analysis flagged anomalies that highlighted unique challenges or barriers. These insights enabled decision-makers to allocate resources more efficiently and equitably, ensuring better access to nutritious food for underserved communities.

WORK EXPERIENCE

Nile Surveys and Geo-solutions LTD *April 2014-December 2015*

Survey Party Chief

- Worked on the Kalobeyei Settlement Scheme in Kakuma. Was in the team that performed the topographical survey as well as the spatial planning of the scheme. A UNHCR project.
- Worked on the pipeline route survey for the provision of water in Bentiu refugee camp, Unity State, South Sudan. A UNICEF project.
- Worked on the cadastral survey of Konza Technopolis, a Kenyan Vision 2030 project funded by the Kenyan government.

Corsmap *September 2017-December2021*

Co-Founder

- Together with two others, we created a Geographic Information System (GIS) for all the Continuously Operating Reference Stations (CORS) for Africa. In total we web-mapped and created a system with data and metadata of more than 250 CORS across 28 African Countries.

Cheswick Surveys *January 2016-Present*

Owner/Projects Lead

- Worked on drone/UAV mapping of 3km2 for a run-of-the-water power project. Came up with an Orthomosaic and Digital Elevation model using Pix4D processing software. Digitized cadastral maps using ArcGIS software and then subsequently overlaying the two. Created a GIS database of the same by including attributes such as title number, acreage etc.
- Sold software and hardware products for Carlson Software, an American software company founded in 1983 with headquarters in Kentucky, USA. Their most famous offerings include Carlson Survey, SurvPC, SurvCE, Photo Capture etc.
- Helped individuals and entities in carrying out cadastral and topographical surveys securing their investments and putting them on a path to create optimal architectural and engineering designs for their projects.

SETAC Engineering Consultancy *January 2021-Present*

GIS and Land Survey Consultant

- Carried out a topographical survey on canals, sub-canals and basins for the purpose of rehabilitating Aweil Rice Scheme in Aweil, Northern Bahr-el-Ghazal State, South Sudan. My drawings were used as the basis for the subsequent engineering designs. A Food and Agriculture Organization (FAO) project.
- Topographical survey of proposed UNICEF offices in Kismayo, Beledweyne and Lansalet UN camps in Somalia. A UNICEF project.
- Topographical survey of proposed extension of the Bosaso Coast Guard in Bosaso, Somalia. A European Union (EU) funded project

CERTIFICATES

- Kaggle: Geospatial Analysis
- Udemy: Spatial Analysis and Geospatial Data Science in Python
- Udemy: Google Earth Engine for Machine Learning and Change Detection
- Udemy: Complete Tensorflow 2 and Keras Deep Learning Bootcamp(Ongoing)
- Esri: Spatial Data Science; The New Frontier in Analytics
- Esri: Make an Impact with Modern GeoApps (ArcGIS Storymaps, Experience builder, Dashboards and InstantApps)
- Kenya Civil Aviation Authority: Remote Pilot's License

INTERESTS AND HOBBIES

- **Favorite books:** Virtuous Leadership (Alexander Havard), Zero to One (Peter Thiel), Linchpin (Seth Godin), Atomic Habits (James Clear).
- **Natural abilities:** I write well. I wrote dozens of articles in my previous industry which got published in leading industry magazines at the world stage.

REFERENCES

NB: Can be provided on request