Chima Jude Iheaturu, Ph.D. (cand.)

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Profile Summary

Ph.D. researcher specialized in **remote sensing and forest mapping** with over 5 years of experience in photogrammetry, LiDAR, and geospatial analysis. Expertise in integrating **UAV (drone) imagery**, **laser scanning** point clouds, and **multi/hyperspectral data** to model the spatio-temporal dynamics of forests. Demonstrated proficiency in **machine learning** (e.g. semantic segmentation) for land-cover analysis and in programming (especially **Python**) for processing large remote sensing datasets. Track record of scientific excellence with multiple first-author publications in international journals, and experience presenting research at global conferences (e.g. EGU, AGU, ForestSAT, ISPRS). Recognized for strong scientific writing (Best M.Sc. Thesis Award) and effective communication skills, including mentoring students and leading training workshops. Actively contributes to project **proposal writing** and has secured several research **grants/awards**, reflecting a commitment to academic innovation and collaboration.

Education

University of Bern – *Ph.D. in Geography & Sustainable Development (in progress, Nov 2021 – Oct 2025)*

- **Dissertation:** Multi-scale remote sensing of forest dynamics in West African tropical landscapes (integrating UAV photogrammetry, LiDAR, and satellite imagery).
- Visiting Research Scholar at University of Washington, Seattle, USA (Sep – Dec 2023), collaborating on remote sensing for forest ecology.

University of Glasgow – *M.Sc. in Geospatial & Mapping Sciences (Distinction, 2017 – 2018)*

- Graduated with Distinction; *Best Project Award*. Thesis focused on **Low-cost 3D documentation of long-term GNSS sites using Structure-from-Motion (SfM) photogrammetry**.

Imo State University, Nigeria – *B.Sc. (Hons) in Surveying & Geoinformatics (First Class Honours, 2009 – 2014)*

- Graduated top of class (valedictorian) with awards for **Best Graduating Student** in Surveying and in the Faculty of Environmental Science. Coursework emphasized geodesy, photogrammetry, and GIS.

Professional Experience *(selected relevant experience)*

GIS & Database Manager – Wildlife Conservation Society (WCS) – *Nigeria, Oct 2020 – Oct 2021*

- Led geospatial data management for conservation projects, ensuring timely data curation and quality control for **forest monitoring** programs.
- Performed advanced **spatio-temporal analysis of forest cover** in protected areas using satellite imagery and time-series data; identified deforestation hotspots and trends to inform management decisions.
- Employed **machine learning** techniques (object-based classification) to map and quantify forest cover changes. **Ground-truthed** remote sensing analyses via field surveys in tropical forest reserves.
- Produced high-quality maps, dashboards, and reports for stakeholders, effectively communicating forest status and land-use changes. Facilitated cross-team decision-making by integrating socio-economic field data with spatial analyses.
- **Key Achievements:** Developed a semi-automated pipeline (Python/ArcGIS) for routine forest cover updates; contributed to conservation planning that improved protection strategies for two national park areas.

GIS Analyst & UAV Pilot – ENVI Geospatial Ltd. – *Abuja, Nigeria, Jan 2019 – Oct 2020*

- Provided **drone mapping** and photogrammetry services: planned and executed UAV flights to collect aerial imagery for environmental and engineering projects, generating high-resolution orthophotos and 3D terrain models.
- Performed comprehensive **GIS and remote sensing analyses** (e.g., land use/land cover classification, change detection) using multispectral satellite data and **LiDAR** datasets for clients in ecology and infrastructure.
- Conducted field **ground-truthing** and validation of remote sensing results, ensuring accuracy of deliverables such as vegetation maps and topographic models.
- Authored project **proposals and technical reports**, contributing to successful acquisition of new projects and funding for the company's geospatial services.
- **Mentorship & Training:** Supervised and trained junior analysts and interns – led workshops on GIS software (ArcGIS, QGIS) and **surveying instrumentation** (GPS, Total Station, UAV operation). Introduced workflow automation (Python scripting) to optimize data processing and reduce operational costs.
- **Key Achievements:** Spearheaded the integration of **drone LiDAR** into the company's services, improving 3D mapping accuracy for a forestry plantation survey project; received commendation for client delivery excellence.

**(Additional experience prior to 2019 includes roles as a Research Assistant and Surveyor, involving GIS analysis, Python scripting for geospatial automation, and training of university students in geoinformatics. Details available upon request.)*

Selected Publications *(peer-reviewed articles relevant to forest mapping & remote sensing)*

- **Iheaturu, C. J.**, Wingate, V.R., Akinyemi, F.O., & Ifejika Speranza, C. (2025). *An integrated object-based sampling approach for validating non-contiguous forest cover maps in fragmented tropical landscapes*. **International Journal of Applied Earth Observation and Geoinformation**, 109: 102775.
- Hepner, S., Agonvonon, G.A., Ehbrecht, M., **Iheaturu, C.**, Azihou, A.F., & Ifejika Speranza, C. (2025). *Degradation and fragmentation effects on structural complexity in West-African forest patches*. **Biotropica**.
- **Iheaturu, C. J.**, Hepner, S., Batchelor, J.L., Agonvonon, G.A., Akinyemi, F.O., Wingate, V.R., & Ifejika Speranza, C. (2024). *Integrating UAV LiDAR and multispectral data to assess forest status and map disturbance severity in a West African forest patch*. **Ecological Informatics**, 84: 102876.
- **Iheaturu, C. J.**, Okolie, C., Ayodele, E., Egogo-Stanley, A., Musa, S., & Ifejika Speranza, C. (2024). *Combining Google Earth historical imagery and UAV photogrammetry for urban development analysis*. **MethodsX**, 12: 102785.
- Njar, N. G., **Iheaturu, C. J.**, Inyang, U. B., Okolie, C. J., Daramola, O. E., & Orji, M. J. (2024). Dynamics of Land Cover Change in the Anambra River Basin of Nigeria and implications for Sustainable Land Management. Quaestiones Geographicae.
- Owuor, M., Santos, T. M. T., Otieno, P., Mazzuco, A. C. A., **Iheaturu, C.J,** & Bernardino, A. F. (2024). Flow of mangrove ecosystem services to coastal communities in the Brazilian Amazon. *Frontiers in Environmental Science*, 12, 1329006.
- Zakari, R. Y., Shafik, W., Kalinaki, K., & **Iheaturu, C. J.** (2024). Internet of Forestry Things (IoFT) Technologies and Application in Forest Management. In ADVANCED IOT TECHNOLOGIES AND APPLICATIONS IN THE INDUSTRY 4.0 DIGITAL ECONOMY (pp. 1-20). Taylor & Francis.
- **Iheaturu, C. J.,** Okolie, C., Ayodele, E., Egogo-Stanley, A., Musa, S., & Speranza, C. I. (2023). Dataset of urban development analysis in a section of Kuje Area Council, Abuja, Nigeria. Data in brief, 46, 108777.
- Wingate, V.R., Akinyemi, F.O., **Iheaturu, C. J.**, & Ifejika Speranza, C. (2022). *A remote sensing-based inventory of West African tropical forest patches: A basis for enhancing their conservation and sustainable use*. **Remote Sensing**, 14(24): 6251.
- Amuyou, U.A., Wang, Y., Ebuta, B.F., **Iheaturu, C. J.**, & Antonarakis, A.S. (2022). *Quantification of above-ground biomass over Cross River State, Nigeria using Sentinel-2 data*. **Remote Sensing**, 14(22): 5741.
- Gbopa, A., Ayodele, E., Okolie, C., Ajayi, A., & **Iheaturu, C.J.** (2021). Unmanned Aerial Vehicles for Three-dimensional Mapping and Change Detection Analysis. Geomatics And Environmental Engineering, 15(1), 41. doi: 10.7494/geom.2021.15.1.41
- **Iheaturu, C. J.**, Ayodele, E.G., & Okolie, C.J. (2020). *An assessment of the accuracy of Structure-from-Motion (SfM) photogrammetry for 3D terrain mapping*. **Geomatics, Land Management and Landscape**, 2(2020): 65–82.

Honors and Awards

- **Best M.Sc. Project Award**, Geospatial and Mapping Science program – University of Glasgow (2018).
- **The Hydrographic Society in Scotland (THS) Student Award** – Outstanding MSc Performance (2018).
- **University of Glasgow African Excellence Award** – Full scholarship for MSc study (2017).
- **Governor's Prize** for Best Graduating Student, Dept. of Surveying & Geoinformatics – Imo State University (2014).
- **Governor's Prize** for Best Graduating Student, Faculty of Environmental Science – Imo State University (2014).

Grants and Scholarships

- **ISPRS Foundation Young Author Award** – Travel grant for ISPRS Geospatial Week conference (2023).
- **UniBE Research Stay Grant** – University of Bern funding for visiting scholar at Univ. of Washington (2023).
- **Digital Earth Africa Travel Support** – Grant to present at American Geophysical Union (AGU) Fall Meeting (2023).
- **Support for Young Researchers (University of Bern)** – Funding for ISPRS Geospatial Week presentation (2023).

(Demonstrated success in securing competitive grants; also contributed to internal funding proposals during Ph.D. research.)

Technical Skills

- **Programming & Data Analysis:** Proficient in Python (NumPy, pandas, GDAL/rasterio, scikit-learn, TensorFlow/PyTorch for deep learning), R (tidyverse, raster), and MATLAB; familiar with C++ and JavaScript (Google Earth Engine API) for specialized geospatial applications.
- **GIS & Remote Sensing:** Expert in ArcGIS Pro, QGIS, ENVI/ERDAS Imagine, SNAP; experienced in Google Earth Engine for large-scale satellite data processing. Skilled in deriving spectral indices and classifiers from **multispectral and hyperspectral imagery** (e.g., Sentinel-2, Landsat, HyMap).
- **Photogrammetry & 3D Mapping:** Experienced in UAV mission planning and **Structure-from-Motion (SfM)** photogrammetry (Agisoft Metashape, Pix4D) to produce DEMs and orthomosaics. Strong skills in **LiDAR** data processing and 3D point cloud analysis (Terrestrial Laser Scanning and UAV LiDAR; tools: LAStools, CloudCompare), for forest structure and biomass estimation.

- **Machine Learning & Image Analysis:** Implementation of **semantic segmentation** and object detection on aerial imagery (using deep learning frameworks). Development of custom remote sensing workflows for land cover mapping and change detection.
- **Other:** Version control (Git), Linux-based geoprocessing, database management (PostGIS), and excellent scientific visualization (GIS cartography, R, Python Matplotlib/Seaborn).

Languages

English (Fluent; Native), Igbo (Native), Yoruba (Professional working proficiency), French (A1). *Note:* Currently learning German (A1) with intent to achieve working proficiency.

Professional Affiliations

- **Member**, International Society for Photogrammetry and Remote Sensing (ISPRS) – actively involved in WG on UAV and forest remote sensing.
- **Member**, Global Land Programme (GLP) – contributing to land-use and land-cover change research network.
- **Member**, GEO Bon (Group on Earth Observations – Biodiversity Observation Network) – interest in biodiversity monitoring techniques.
  (Also affiliated with national geoinformation and surveying societies; full list available.)