Titus Tienaah

Geomatic Engineering Dept.
KNUST, Kumasi, Ghana
github.com/intdxdt

Education

2011 – 2018 **PhD, Geographic Information Systems (GIS)**, *Geodesy and Geomatics Engineering, University of New Brunswick, Fredericton, Canada.*

Dissertation Line Simplification Under Space Constraints

Focus Contextual line simplification

Advisors Prof. Emmanuel Stefanakis, Prof.(retired) David Coleman

2008 – 2011 **MScE, Geodesy and Geomatics Engineering**, *University of New Brunswick, Fredericton, Canada..*

Dissertation Design and Implementation of a Coastal Collaborative GIS to Support Sea Level Rise and Storm Surge Adaptation Strategies

Focus Public Participatory GIS

Advisor Dr. Sue Nichols

2010 **Diploma of University Teaching**, *Centre for Enhanced Teaching & Learning, University of New Brunswick, Fredericton, Canada..*

Coordinator Peter Gross

Focus Teaching Methods and Assessment

2003 – 2007 **BSc, Geomatics Engineering**, *Faculty of Civil and Geo Engineering, KNUST, Ghana..*

Project Evaluation and Use of ADAM's Technologies MPS-2 Analytical System for Non-Topographic Photogrammetric Applications

Focus Close-Range Photogrammetry

Advisor Mr. A. B. Agyemang

Work Experience

Aug, 2020 – Present **Lecturer**, *Faculty of Civil and Geo Engineering, KNUST, Ghana..*

- Teaching : Information Science and Programming, Image Processing, and Geographic Information Systems.
- Research : Computer Vision, Spatial Data Structures, Digital Earth Research.

April, 2020 – Present **Research Collaborator**, *Discrete Global Grid Systems - Geomatics Engineering, University of Calgary, Calgary, AB, Canada..*

- Research: algorithms and data structures for consistent spatial data representation, heterogeneous integration and analysis.

Nov 1, 2020 – Mar. 31, 2021 **Consultant**, *Professional services for Canada Centre for Mapping and Earth Observation through the University of Calgary*, **Focus**: developed Jupyter Notebooks in Python using geospatial data from a Data Cube Platform using Cloud Optimized GeoTIFF (COG) through a SpatioTemporal Asset Catalog (STAC).
Achievements:

- Developed a training module to exploit 3D data for the generation of an elevation profile;
- Developed a training module to exploit optical satellite imagery (COG files) to support spectral analysis using a STAC API;
- Developed a training module on how to update vector data attributes given COG files in a STAC through parallel processing in Python.

Feb 1 – Mar. 31, 2020 **Consultant**, *Professional services for Canada Centre for Mapping and Earth Observation through the University of Calgary*.
Achievements:

- Developed training modules for learning the Python programming language and how to use it for geospatial processing using Jupyter notebooks.
- Developed a training module on the use of open geospatial standards to build case studies for flood mapping, water data analysis, and geospatial water related queries in Canada.

2015 – Dec.2019 **Geospatial Engineer**, *Resson Aerospace Corporation, Fredericton, New Brunswick*.
Achievements:

- Developed custom multi-scale geographic information systems for visualization of heterogeneous data sources with field detected anomalies, pests, and diseases.
- Designed and implemented corporate GIS automation tools and workflows.
- Developed frontend spatial analytics and maintenance of backend spatial databases
- Developed computer vision solutions for plant counting, spacing, and tracking. In collaboration with the robotics team, developed a realtime see-and-spray system.

2010 – 2011 **Research Associate - ICURA C-Change**.
Implementation of a collaborative GIS to facilitate development of coastal adaptation strategies between coastal communities and university research partners. The platform was developed using the Zend Framework, OpenLayers, ExtJS and PostgreSQL + PostGIS.

2012 – 2013 **Research Consultant**.
An Examination and Critical Comparison of Alternative Maintenance Models for the Nova Scotia Digital Topographic Database. A 2-year consulting study undertaken for the GeoNova Program Office, Service Nova Scotia and Municipal Relations, Province of Nova Scotia, Canada.

Teaching Experience

2020 – 2022 **GE263, Information Science and Programming**.
Geomatic Engineering, KNUST, Kumasi & Obuasi

2022 **GE 251 & GE 351, Principles of Photogrammetry and Stereo Photogrammetry**.
Geomatic Engineering, KNUST, Obuasi Campus

2021, 2022 **GIS 556, GIS customization and programming**.
Geomatic Engineering, KNUST, Kumasi & Accra

2021, 2022 **GE 548, Programming for remote sensing** .
Geomatic Engineering, KNUST, Kumasi

2021– 2022 **GE 561, Web GIS and mobile mapping**.
Geomatic Engineering, KNUST, Kumasi & Accra

2021 **GE 164, Introduction to GIS**.
Geomatic Engineering, KNUST, Kumasi

2020 – 2021 **GE 184, Principles of Land Surveying**.
Geomatic Engineering, KNUST, Kumasi & Obuasi

2011 – 2014 **GGE 2423 & GGE 4423, Introduction and Advanced GIS**.
Geodesy and Geomatics Engineering, University of New Brunswick, Fredericton

2010 – 2011 **GGE 2501 & GGE 4512, Land Administration I & II**.
Geodesy and Geomatics Engineering, University of New Brunswick, Fredericton

2007 – 2008 **Teaching Assistant**.
Photogrammetry and Land Surveying – KNUST, Ghana

Publications

In-Review Tienaah, T., Stefanakis, E., & Coleman, D. Line Simplification While Keeping it Simple or Complex, Journal of Geovisualization and Spatial Analysis - *JGSA, In Review*

In-Review Tienaah, T., Stefanakis, E., & Coleman, D. Topologically Consistent Online Trajectory Simplification, Journal of Geovisualization and Spatial Analysis - *JGSA, In Review*

2017 Adu-Gyamfi, Y. O., Asare, S. K., Sharma, A., & Tienaah, T. (2017). Automated Vehicle Recognition with Deep Convolutional Neural Networks. Transportation Research Record, 2645(1), 113-122.

2015 Tienaah, T., Stefanakis, E., & Coleman, D. Contextual Douglas-Peucker Simplification, Geomatica 69(3)327-338.

2013 Y. O. Adu-Gyamfi; T. Tienaah; N. O. Attoh-Okine; and K. Chandra, A Functional Evaluation of Pavement Condition using a Complete Vision System, Journal of Transportation Engineering. `http://bit.ly/1BQGF7x`

2013 Sutherland, M., T. Tienaah., Seeram, A., Ramlal, B. & Nichols, S. Chapter 7: Public Participatory GIS, Spatial Data Infrastructure, and Citizen-Inclusive Collaborative Governance. Global Spatial Data Infrastructure Association Press, pp. 123-140.

2011 Mioc, D., Anton, F., Nickerson, B., Santos, M., Adda, P., Tienaah, T., ... Tang, P. Chapter 12: Flood Progression Modelling and Impact Analysis. In Efficient Decision Support Systems - Practice and Challenges in Multidisciplinary Domains (pp. 227-246). InTech. DOI: 10.5772/18398

Conference Presentation

2015 Tienaah, T., Stefanakis, E., & Coleman, D. Contextual Line Generalization-Extending ArcGIS Generalization Toolset. In Proceedings of the 18th AGILE international conference on geographical information science (pp. 9-12).

2014 Tienaah, T. Real-time Linear Simplification under Space Constraints. In Proceedings of Spatial Knowledge and Information, Banff, Canada. `http://bit.ly/14lEueR`

2014 Tienaah, T., & Stefanakis, E. Troy is ours - How on earth could Clytaemnestra know so fast? In the Proceedings of the 17th AGILE Conference on Geographic Information Science, Castellon, Spain.

2013 Sutherland, M., Tienaah T.., Seeram, A., Ramlal, B. & Nichols, S. Public Participatory GIS Development to Support Citizen-Inclusive Collaborative Governance as Part of SDI, GSDI Conference, Kenya.

2011 D. Mioc, F. Anton, B. Nickerson, M. Santos, P. Adda, T. Tienaah, A. Ahmad, et.al. Flood Progression Modelling and Impact Analysis. New Brunswick Emergency Measures Organization / UNB Flood Monitoring Project of the St. John River using LiDAR Data. GeoInformation For Disaster Management (Gi4DM 2011), ISPRS, Antalya, Turkey. `http://bit.ly/1BQQEK8`

Research Projects

2015-2017 Tienaah, T.,& Stefanakis, E. Constrained Line Simplification(CLS) for ArcGIS. Engage Project, Industrial partner: Esri Canada.

2012-2013 Tienaah, T., Rak, A. & Coleman, D. An Examination and Critical Comparison of Alternative Maintenance Models for the Nova Scotia Digital Topographic Database. Contract Report of 2-year consulting study undertaken for the GeoNova Program Office, Service Nova Scotia and Municipal Relations, Province of Nova Scotia.

Computer Skills

Programming Languages	C/C++, Go, Rust, Scala, Java, MatLAB, Julia, Python, JavaScript
Spatial Tools	QGIS, OpenJump, DotSpatial, ESRI Products, GDAL, GEOS, LibSpatialIndex
Databases	PostgreSQL, MySQL, SQLite, MongoDB. *Extensions* : PostGIS, SpatiaLite
Machine Learning	TensorFlow, PyTorch, Scikit-Learn
Web	HTML, CSS, Javascript, *Frameworks*: Angular, React, Bootstrap
Typesetting	LaTeX, Microsoft Office, Libre Office
Operating Systems	Linux, Microsoft Windows