

UFUOMA OVIENMHADA

Location: Cambridge, MA

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EDUCATION

Massachusetts Institute of Technology

M.S. Media Arts & Sciences, GPA: 5.0/5.0

PhD. Aeronautics and Astronautics, GPA: 4.9/5.0

Highlighted Coursework: Satellite Engineering, Environmental Conflict, Theory and Practice of Environmental Planning, Geographic Information Systems, Statistical Data science and Machine Learning, Physical Principles of Remote Sensing

Stanford University

B.S. Mechanical Engineering

Cambridge, MA

June 2020

Expected June 2024

Stanford, CA

June 2018

SKILLS

- Google Earth Engine
- ArcMap, ArcGIS, qGIS
- Programming Languages: R, Python, C++, HTML, MatLab
- Sentinel Applications Platform (SNAP)
- Systems Tool Kit (STK)
- SolidWorks, Autodesk
- Adobe Illustrator
- Design and Manufacturing
- French
- Microsoft Excel

RESEARCH PROJECTS & WORK EXPERIENCES

NASA Jet Propulsion Laboratory

Visiting Researcher

*Remote
Sept 2020 - March 2021*

- Assimilated optical satellite data from TROPOMI and CriS satellite instruments to demonstrate a proof of concept of using ammonia observations as a proxy for methane emissions, which are a significant contributor to global warming

Planet Labs

Professional Services Intern

*Remote
June 2020*

- Implemented a methodology to use the Planet Building Detection layer to measure a Sustainable Development Goal indicator, SDG 11.3.1, pertaining to sustainable urbanization.
- My work explored Planet data compatibility with established methods for measuring urbanization, documented difficulties of building a data pipeline with Planet data and demonstrated the temporal and spatial value of using Planet's higher resolution commercial data, as opposed to free lower-resolution options for this SDG indicator

Master's Thesis, MIT Space Enabled Research Group

Graduate Research Assistant

*Cambridge, MA and Cotonou, Benin
Sept 2018 – May 2020*

- *Title:* "Earth Observation to support Low-Cost Environmental Governance: A case study in Benin"
- Synthesized and prepared data from Landsat 5, 7 and 8 and Sentinel 1 and 2
- Programmed a unique algorithm in Google Earth Engine that estimates surface area extent of the invasive water hyacinth plant and the development of an anthropogenic fish farming practice from 1980-Present
- Conducted multiple field work campaigns to obtain high-resolution drone images and water measurements used to validate satellite data classification
- Bootstrapping statistical techniques were used for quality assessment and error estimations
- Mentored 6 undergrads in the design and fabrication of a water quality sensor to support a hyacinth growth suitability model

Phi-Lab of the European Space Agency/ University of Sannio

Visiting Researcher

*Frascati, Italy
January 2020*

- Conducted literature review and comparative analysis on several common frameworks for measuring a nation's development
- Conducted literature review on techniques to utilize remote sensing to measure indicators of the selected framework
- Managed and mentored 4 undergrads in the collection and analysis of data from NASA, ESA and global databases to apply remote sensing techniques to case studies assessing the Inclusive Wealth Index in Cameroon and China
- Remote sensing applications included land cover change and human settlement detection

NASA Goddard, Biospheric Sciences Laboratory

Visiting Researcher

*Greenbelt, MD
June 2019*

- Assimilated optical and radar data from Landsat 5,7, 8, Sentinel 1, and 2 in Google Earth Engine for Mangrove Identification using Random Forest Machine Learning Algorithm. Applied Change Detection to estimate biomass changes.

Public Lab Kits Initiatives

Student Expert Intern

*Providence, RI
July – Sept 2018*

- Partnered with local environmental activists to design and program a low cost air quality sensor for use in quantitative storytelling around the impact of air pollution on low income communities in Providence
- Collaborated with the Rhode Island Dept of Environmental Management to calibrate optical air quality sensors
- Wrote 9 blog posts on the Public Lab site on guidelines for gathering, and interpreting data from optical air quality sensors

Stanford Institute for Innovation in Developing Economies

Mechanical Engineering Intern

*Abidjan, Cote d'Ivoire
June – Aug 2017*

- Designed electronics and welded metal design for solar powered electric tricycle
- Facilitated enterprise-wide design thinking workshop in French to reframe market strategy

Stanford IRIS Design Lab

Stanford, CA

- Developed a JavaScript web program and research study run on 75 subjects at a design conference, IDETC. The study explored whether engineers brainstormed more holistically sustainable designs when primed with different activities
- Designed and programmed a sustainable smart kitchen sink that morphs product behavior for specific task contexts

LEADERSHIP

American Geophysical Union GeoHealth Executive DEI Committee, Student Rep 2022-Present

- Convened AGU'22 oral session on geospatial data for environmental justice
- Convening AGU'23 town hall session inviting environmental justice leaders for a panel on the role of science in activism

MIT Working group on Reimagining Public Safety, Co-Chair 2020-2022

- Helped orchestrate focus groups to gather student and staff feedback
- Lead identification of recommendations to address holistic public safety on campus including the development of a co-response model leveraging mental health clinicians alongside police

MIT Black Graduate Students Association, Co-President 2019-2021

- Wrote and disseminated a Petition to Support Black Lives at MIT garnering over 5000 signatures from students, staff and faculty. The petition resulted in several tangible changes pertaining to DEI and public safety
- Collaborated with abolitionist organizers from Boston, New York and Chicago to host a virtual teach-in to discuss the defund the police movement. The event had 1000+ attendees. <http://web.mit.edu/webcast/bgsa/s21/>
- Work with the MIT Office of Graduate Education on University-wide Diversity procedures and programs
- Oversee a team of 7 people to execute events with 100+ attendance for the Black graduate community
- Conduct outreach events with K-12 and Undergraduate students outside of MIT

Stanford Society of Black Scientists and Engineers, Outreach Chair 2016 - 2018

- Lead organizer of the first ever SBSE STEM Outreach Programs reaching over 600 Black Students
- Designed 4 workshops on topics including CAD, Arduino, electromechanical systems and Design thinking
- Mentored 6 groups to design and prototype individually designed projects

PUBLICATIONS

1. Carrera, D., **Ovienmhada, U.**, Hussein, S., Soden, R. (2023). "The Unseen Landscape of Abolitionism: Examining the role of digital maps in grassroots organizing". In CSCW '23: ACM CSCW Conference on Computer Supported Cooperative Work, October 14-18, 2023, Minneapolis, Minnesota. New York, NY, USA. Accepted.
2. **Ovienmhada, U.**, Pellow, D., Wood, D. (2023). "Satellite Data for Environmental Justice: Perspectives from Anti-prison Activists on the uses of Geospatial Data". Environmental Justice. Under Review
3. Sayyed, T.K. *, **Ovienmhada, U***, Kashani, M *, Vohra, K., Kerr, G., O'Donnell, C., Harris, M., Gladson, L., Titus, A., Adamo, S., Fong, K., Gargulinski, E., Soja, A., Anenberg, S., and Kuwayama, Y. (2023). "Satellite Data for Environmental Justice: A Scoping Review". Environmental Research Letters. In Prep. (* indicates co-first authorship)
4. **Ovienmhada, U.**, Lombardo, S., Wood, D. (2023). "Multi-sensor Change Detection and Machine Learning for Water Hyacinth Identification: A Case Study of Benin". In Prep.
5. **Ovienmhada, U.**, Wood, D (2021). "Inclusive Design of Earth Observation Decision Support Systems: A case study of Lake Nokoue". Frontiers in Climate.

Selected Presentations and Invited Talks

1. Ovienmhada, U. (2023). "Satellite Data for Environmental Justice". The Future of Technology in a Just Transition Symposium, AYA Research Institute. Invited Speaker
2. Ovienmhada, U. (2022). "Using Satellite Data and Scientific Information to Advance Environmental Justice". VALUABLES Consortium. Invited Panelist
3. Ovienmhada, U. (2022). "Complex Engineering Systems and Liberation Movements." Critical Computing Seminar, University of Toronto. Invited Talk
4. Ovienmhada, U., Wood, D. (2022). "Earth Observation Data Applied to Measure Environmental Injustice in United States Prison Landscapes." International Astronautical Congress. Paris, FR.
5. Ovienmhada, U., Wood, D. (2022). "Co-Producing Remote Sensing Tools to Advance Environmental Justice in Prison Landscapes." American Geophysical Union, Chicago, IL.
6. Ovienmhada, U. (2022). "On love, truth and justice at MIT." 48th Annual Martin Luther King, Jr. Celebration, MIT. Invited Graduate Speaker
7. The Environment-Vulnerability-Decision-Technology Modeling Framework Applied to Environmental Justice Activism in Carceral Landscapes. *American Geophysical Union*, New Orleans. Dec 2021
8. Ovienmhada, U. (2022). "STEM @ STARLIGHT: Low-Cost Water Sensors." East Carolina University.
9. Ovienmhada, U. (2021). "Surviving Global Change: GeoHealth, Marginalized Communities and Environmental Justice in the Anthropocene." American Geophysical Union, New Orleans, LA. Invited Talk
10. *Remote Sensing Society*, Boston, MA. Nov 2019.
11. Earth Observation and in-situ data to inform understanding of water hyacinth growth on Lake Nokoue in Benin. *International Astronautical Congress*. Dubai, UAE. Oct 2021
12. Antidisciplinary: Science and Engineering in the Digital Age. *American Geophysical Union*, San Francisco, CA. Dec 2019.
13. Citizen Science in the Future of Earth Observation. *International Astronautical Congress*. Washington, D.C. Oct 2019

TEACHING EXPERIENCE

Kaufman Teaching Certificate Program

Sept – Dec 2022

- Designed a draft syllabus for an original course titled “Science, Technology and Environmental Justice”
- Used backward design to plan a unit of instruction that includes realistic, measurable, specific, and student-centered learning outcomes, activities, and assessments.
- Learned inclusive teaching principles and incorporated into course design

Streetcode Academy

East Palo Alto, CA

Design Co-Facilitator

Feb – April 2018

- Co-instructor of 25 low-income high school students for 10-week ‘Makerspace’ course
- Designed workshops on vinyl cutting, laser cutting, electronic prototyping and 3D printing
- Managed \$2000 budget for food and class materials.

CSIC: Introduction to Computing at Stanford

Stanford, CA

Instructor

Sept – Dec 2017

- Primary course instructor for 17 students
- Built curriculum around computer security, computing resources and web development

GRANTS

National Aeronautics and Space Administration, “A.49 Earth Science Applications: Equity and Environmental Justice”, \$250,000, Grant # 80NSSC22K1673 (Danielle Wood), Lead Author

PROJECTS

- *Roadmap to Abolition (ongoing)*: Digital map of community models and organizations in Massachusetts that work to address community safety, violence, and harm without policing and incarceration. We seek to include organizations that facilitate prevention programs, diversion, mediation, mutual aid and more. This digital map will include a guided tour through real public safety scenarios and provide information about how particular organizations have addressed these scenarios in the past. <https://roadmaptoabolition.com/>
- *BeaverCube*: Computed multi-scenario lifetime estimations using Orbital STK to contribute to the conceptualization, planning and formulation of a CubeSat mission. PDR Proposal was accepted for launch in 2020 by NASA’s CSLI program.

AWARDS

MIT Graduate Women of Excellence

May 2023

Takeda Fellowship

June 2021

MIT RISE Award for Excellence in Diversity, Equity and Inclusion

May 2021

OGE John Hennessy Fellowship

Sept 2020

Future Space Leaders Scholarship

June 2021

Secure World Foundation Scholarship

July 2019

MIT Water Night, Best Poster

February 2019

Horowitz Student Research Award

January 2019

Elements Fellowship

Sept 2018

GEM Associate Fellowship

June 2018

NSBE Stanford Chapter, Senior of the Year

June 2018

Alpha Phi Alpha ‘Golden Goddess’ Community Service Award

June 2017

NSBE Stanford Chapter, Member of the Year

June 2017

Lunsford Nomination for Public Speaking

May 2016