

JOAN NWATU

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RESEARCH INTERESTS

My research integrates computational social science and AI ethics, combining technical model evaluation with socio-cultural insight to improve fairness, diversity, and interpretability in multimodal AI systems.

EDUCATION

Ph.D. Student - Computer Science and Engineering [University of Michigan, Ann Arbor, USA](#)

📅 April 2027 (Expected Graduation) 🗺 Ann Arbor, MI

- Research on representation in AI, specifically in vision & language (VL)
- Advised by Rada Mihalcea
- Member, Language and Information Technologies (LIT) Lab
- Member, Rackham AI Ethics and Equity Research Group
- GPA 4.0/4.0

B.Eng. Electronic Engineering [University of Nigeria, Nsukka, Nigeria](#)

📅 Oct 2014 – Sept 2019

📍 Nsukka, Enugu, Nigeria

- GPA 4.45/5.0

EXPERIENCE

Graduate Research Assistant

[University of Michigan](#)

📅 August 2022 – Present

📍 Ann Arbor, MI, USA

- Audited large-scale vision–language (VL) models for cross-cultural and socioeconomic bias, uncovering systematic performance gaps across income levels, countries, and object domains. These analyses informed recommendations for equitable evaluation protocols adopted in follow-up research and published at [1] EMNLP 2023 and [5] NAACL 2025.
- Designed and implemented interventions to mitigate cultural and income bias in VL systems through methods such as socioeconomic-aware prompting, visual similarity-based annotation strategies, participatory dataset construction, and geographically balanced data augmentation, as explored in [3] COLING 2024 and [4] NeurIPS 2024.
- Led data collection and representation reform by reframing traditional object-centric annotation pipelines into a function-centric ontology, enabling more inclusive modeling of daily-life visual diversity across 50+ countries. This framework, introduced in the Culture Affordance Atlas [7], contributes a scalable blueprint for designing culturally grounded datasets.
- Contributed to position and reflection papers, including Why AI Is WEIRD [6] at AAAI 2025 and Has It All Been Solved? [2] at COLING 2024, advocating for inclusive, participatory AI research and emphasizing the societal stakes of knowledge centralization in large language and vision models.

AWARDS

Finalist, 3-Minute Thesis Engineering Graduate Symposium 2025 - University of Michigan

Awardee, 2022/2023 CSE Departmental Fellowship Award - University of Michigan

Awardee, 2021/2022 IELTS Prize - British Council Nigeria

1st Prize Solution Winner - 2020 Data Science Nigeria AI Commons Health and Wellbeing Hackathon

Student Scholar, 2019 Grace Hopper Celebration - Anita B.org

Awardee, 2016 Petroleum Technology Development Fund Scholarship (PTDF-LSS)

Awardee, 2016 NNPC/Chevron JV Undergraduate Scholarship

TECHNICAL SKILLS

Languages

Python

C

Machine Learning Libraries

NumPy

Pandas

Matplotlib/Seaborn/Plotly

PyTorch/Scikit-Learn

NLTK/SpaCy/FastAI

Rasa Stack

Big Data

Apache Hadoop/Spark/Hive/Airflow

Amazon Web Services/ Azure Databricks

SQL/NoSQL

MATLAB/Tableau/PowerBI

Artificial Intelligence Engineer (R&D)

Xend

📅 Nov 2019 – Jun 2022

📍 Enugu, Nigeria

- Proposed and developed a data analytics system for Xend merchants to extract and display insights from customer data leading to improved sales performance.
- Researched and implemented a computer vision project to solve the problem of Logo Identification using Pytorch pre-trained ResNet50 and Fastai library
- Set up an ETL pipeline to facilitate the extraction and transformation of data required for a Sales Prediction project using Amazon Web Services and Spark.
- Identified the problem of data inconsistency, conceptualized an efficient solution and deployed a data lake as a central data repository for Oggwugo Food Services using Amazon Web Services, Apache Spark, and Apache Airflow.

Machine Learning Intern

Ugarsoft Ltd

📅 May 2018 – September 2019

📍 Enugu, Nigeria

- Gathered and organized customer data for Natural Language Processing and Recommender System projects.
- Assisted with labeling entities in customer order data for Named Entity Recognition tasks.
- Retrained the Named Entity Recognition and Intent Classification models for an e-commerce chatbot system using Rasa Stack.
- Analyzed customer data using predictive modeling and drafted reports using data visualization techniques.

PUBLICATIONS

1. Bridging the Digital Divide: Performance Variation across Socio-Economic Factors in Vision-Language Models ([EMNLP 2023](#))

Joan Nwatu*, Oana Ignat*, Rada Mihalcea

🔗 <https://aclanthology.org/2023.emnlp-main.660/>

2. Has It All Been Solved? Open NLP Research Questions Not Solved by Large Language Models ([COLING 2024](#))

Oana Ignat*, Zhijing Jin*, Artem Abzaliev, Laura Biester, Santiago Castro, Naihao Deng, Xinyi Gao, Aylin Gunal, Jacky He, Ashkan Kazemi, Muhammad Khalifa, Namho Koh, Andrew Lee, Siyang Liu, Do June Min, Shinka Mori, **Joan Nwatu**, Veronica Perez-Rosas, Siqi Shen, Zekun Wang, Winston Wu, Rada Mihalcea

🔗 <https://aclanthology.org/2024.lrec-main.708/>

3. Annotations on a Budget: Leveraging Geo-Data Similarity to Balance Model Performance and Annotation Cost ([COLING 2024](#))

Oana Ignat, Longju Bai, **Joan Nwatu**, Rada Mihalcea

🔗 <https://aclanthology.org/2024.lrec-main.112/>

4. CVQA: Culturally-diverse Multilingual Visual Question Answering Benchmark ([NeurIPS 2024](#))

David Romero*, Chenyang Lyu*, Haryo Akbarianto Wibowo*, ..., Oana Ignat, **Joan Nwatu**, Rada Mihalcea, Thamar Solorio, Alham Fikri Aji

🔗 <https://arxiv.org/pdf/2406.05967.pdf>

INVITED TALKS

Machine Learning Bootcamp Speaker

University of Nigeria Engineering Career Fair

📅 Sept 2021

📍 Enugu, Nigeria

- Delivered a lecture on 'Introduction to Artificial Intelligence and Possible Career Paths' and led Engineering students and recent graduates through a guided deep learning project practical using Fastai.

Research Talk Speaker

University of Michigan African Study Center 15th Year Anniversary

📅 April 2024

📍 Ann Arbor, Michigan

- Shared my research on unequal representation in vision-language models.

Panelist

University of Michigan African Study Center African Women Film Festival 2025

📅 November 2025

📍 Ann Arbor, Michigan

- Contributed Ethical AI perspectives to a panel on AI and Filmmaking in Africa

Joint-Keynote Speaker

Responsible Foundation Models Workshop Co-located with NeurIPS 2025

📅 November 2025

📍 Mexico-City, Mexico

- Gave a keynote on socially responsible vision-language models with Rada Mihalcea

LEADERSHIP & SERVICE

Admissions Recruitment Liason CSE Graduate Org.

University of Michigan, Ann Arbor

📅 May 2023 – May 2025

- Developed and implemented strategies to improve admission processes and student diversity
- Facilitated student recruitment campaign at Computing Conferences (Grace Hopper/Tapia)

Webmaster LIT Lab

University of Michigan, Ann Arbor

📅 May 2023 – Present

- Managed LIT website publications

AI and Accessibility

Michigan AI Symposium

University of Michigan, Ann Arbor

📅 Nov 2022

5. Uplifting Lower-Income Data: Strategies for Socioeconomic Perspective Shifts in Vision-Language Models ([NAACL 2025](#))

Joan Nwatu, Oana Ignat, Rada Mihalcea

🔗 <https://aclanthology.org/2025.nacl-long.106.pdf>

6. Why AI Is WEIRD and Should Not Be This Way: Towards AI For Everyone, With Everyone, By Everyone ([AAAI 2025](#))

Rada Mihalcea, Oana Ignat*, Longju Bai, Angana Borah, Luis Chiruzzo, Zhijing Jin, Claude Kwizera, Joan Nwatu, Soujanya Poria, Thamar Solorio*

🔗 <https://ojs.aaai.org/index.php/AAAI/article/view/35092>

7. Culture Affordance Atlas: Reconciling Object Diversity through Functional Mapping ([AAAI 2026](#))

Joan Nwatu, Longju Bai, Oana Ignat, Rada Mihalcea

🔗 <https://arxiv.org/abs/2512.03173>

ACADEMIC & PROFESSIONAL MEMBERSHIPS

Black in AI

ACL Association for Computational Linguistics

AnitaB.org Local Community - Africa

GSBES Graduate Society of Black Engineers and Scientists

Black SiS Black Sisters in STEM

NSE Nigerian Society of Engineers

NUESA Nigerian University of Engineering Students Association

APWEN Association of Professional Women Engineers in Nigeria

- Facilitated registration and reception of the symposium attendees.

Vice President

Nigerian Society Of Engineers (UNN)

University of Nigeria

📅 Dec 2016 - Dec 2017

- Planned and organized a successful Mechatronics workshop/seminar for UNN engineering students.
- Worked with the team of NSE executives to promote and sustain a seasoned engineering undergraduate experience for students.

Honorable Member

NUESA House of Representatives

University of Nigeria

📅 Oct 2015 - June 2016

- Participated in important decision-making, bill approvals, and dissemination of relevant information to the students
- Represented the interest of my constituency and conveyed the complaints of the students to higher authorities