

# Abiodun Modupe, Ph.D

## Citizenship Status: Permanent Resident

+1(832) 774-3303 [✉ abiodunmodupe@gmail.com](mailto:abiodunmodupe@gmail.com)

[in](#) abiodun-modupe

[Google Scholar](#)

[dupsys](#)

## Education and Qualification

- 2018 – 2024 **Ph.D. Computer Science**,  
University of the Witwatersrand,  
Johannesburg, South Africa.
- 2009 – 2011 **MIT Computer Science**,  
Tshwane University of Technology,  
Pretoria, South Africa.
- 1991 – 1997 **BSc Hons Computer Science with Mathematics**,  
Obafemi Awolowo University,  
Ile-Ife, Osun State, Nigeria.

## Research Interests

- Natural Language Processing (NLP), Multilingual & Multimodal AI, Machine Learning & Deep Learning, Computational Social Science & Data Science for Social Impact

## Experience

- 2019 – Current **Lecturer & Coordinator of Big Data Science (BDS) programme**,  
*University of Pretoria*, Pretoria, South Africa.
- 2017 – 2019 **Visiting Scholar**, *Council for Scientific and Industrial Research (CSIR)*,  
Pretoria, South Africa.
- 2016 – 2017 **Tutor/Teaching Assistant**, *University of the Witwatersrand*,  
Johannesburg, South Africa.
- 2012 – 2016 **Independent Contractor (eTutor)**, *University of South Africa*,  
Johannesburg, South Africa.
- 2011 – 2016 **Lecturer (Contract)**, *Tshwane University of Technology*,  
Pretoria, South Africa.
- 2004 – 2008 **System Analyst (Back-End)**, *First City Monument Bank*  
(formerly First Atlantic Bank), Victoria Island, Lagos State, Nigeria.
- 1999 – 2004 **System Engineer**, *Alpha-beta Consulting*, Ijora, Lagos State, Nigeria.

## MSc & PhD Thesis

- 1991– 1997 **Project: Dermatologist diagnosis using machine learning model**  
**Advisors:**  
Prof. Rotimi Adagunodo
- 2009 – 2011 **Thesis: Intelligent Identification of Advanced Fee Fraud Activities on the Internet.**  
**Advisors:**  
Prof. Olusegun Ojo  
Prof. Oludayo O. Olugbara
- 2018 – 2024 **Thesis: Regularized Deep Neural Network for Post-Authorship Attribution.**  
**Advisors:**  
Prof. Turgay Celik  
Prof. Vukosi Marivate

# University Teaching Experience

2019 – Current

📖 University of Pretoria, Pretoria, South Africa. DSFSI<sup>1</sup>

- Programme Coordination:
  1. Coordinator of the Big Data Science stream in the MIT programme.
  2. Oversight of curriculum, student mentorship, research supervision, and module delivery.
- Teaching & Curriculum Development
  1. Designed and taught several postgraduate courses, such as MIT801 – Intro to Machine & Statistical Learning, MIT808 – Big Data Science Project, COS801 – Deep Learning, COS781 – Data Mining, & COS760 – Natural Language Processing.
  2. Led the redesign and evaluation of course content, assessments, and project-based learning.
- Postgraduate Supervision & Mentorship
  1. Supervised or co-supervised over 15 MIT dissertations, as well as several MSc and PhD students across several research domains, such as NLP, fraud detection, credit scoring, vehicle damage estimation, sign language recognition, and computational science
  2. Guided students in publication writing, software prototyping, and real-world deployment.
- Research & Project Leadership
  1. Active member of the Data Science for Social Impact (DSFSI) group.
  2. Led or co-led grants on multilingual NLP, misinformation detection, financial inclusion, and SDG impact analytics.
  3. Published in top journals (IEEE Access, Applied Sciences, etc.) and conferences (SMC, AFRICON, etc.)
- Community Engagement & Conference Involvement
  1. Active member of the Data Science for Social Impact (DSFSI) group.
  2. Served on programme committees (SAICSIT, SACAIR).
  3. Participated in community-driven initiatives such as DLI, Masakhane, and AI4D.
  4. Delivered invited talks both locally and internationally (e.g., UP Colloquium, E-Voting South Africa, All You Need Is Community, G20 AI, & AI4D Partners Meeting:2025).

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<sup>1</sup>Data Science for Social Impact Research Group

## University Teaching Experience (continued)

2016 – 2017

■ University of the Witwatersrand, Johannesburg, South Africa.

- Summary of Responsibilities (2016–2017) – Teaching Assistant to Prof. Turgay Celik
  1. Supported delivery of postgraduate modules in machine learning and data science.
  2. Facilitated tutorial sessions, explained key theoretical concepts, and guided students through practical assignments.
  3. Assisted in grading and marking coursework, programming assignments, and final exams in accordance with university standards.
  4. Provided consultation support, offering academic assistance and feedback to students on their learning progress.
  5. Contributed to the preparation of teaching materials, including lecture slides, code notebooks, and assessment rubrics.
  6. Collaborated closely with Prof. Celik on academic planning, ensuring alignment between course objectives and student performance metrics.

2012 – 2016

■ University of South Africa, Johannesburg, South Africa.

- My tutoring responsibilities for COS2621 at Unisa (2012–2016) involves:
  1. The curriculum cover principles of different memory types, including cache, internal, and external memory.
  2. Include functionality of the CPU, memory, buses, and I/O devices and how they connect.
  3. Teach students how binary, integers, and floating-point numbers are represented and manipulated.
  4. Encourage critical thinking by having students evaluate the advantages and disadvantages of different technologies, such as I/O devices.
  5. Help students develop problem-solving skills within the context of the module's topics.

2011 – 2016

■ Tshwane University of Technology, Tshwane/Pretoria, South Africa.

- Taught core modules such as Discrete Structures (DCT115D), Principles of Programming B (PPB115D), Advanced Object-Oriented Programming (AOP216D), Information Security (ISC216D), Operating Systems (ORS216D), and Research Project (RRS108G), achieving an 85% student pass rate
- other responsibilities include:
  1. Prepared and delivered lectures, tutorials, and practical lab sessions.
  2. Set and assessed assignments, tests, and exams.
  3. Supervised and evaluated undergraduate research projects.
  4. Provided academic support and consultation to students.
  5. Contributed to curriculum development and module improvement.

## Technical Expertise

Research Interest	Large language models, Information retrieval, Sentence alignment, Machine translation, Multilingual NLP, & Digital humanities and forensic linguistics.
Technical Skills	Python, PyTorch, TensorFlow, Transformers, DataScience, Neural Networks, Deep Learning.
Datasets & Tools	Multilingual corpora, Cross-lingual embeddings, & Parallel text mining

## Computing Proficiency

OS	Mac OS X, LINUX (UBUNTU, AND DEBIAN), Windows.
Scientific	Python, MatLab, Java.
DL Framework	TensorFlow, PyTorch, Keras.
Statistics Package	R, Pkanalix, Monolix.
Databases	MySQL, PostgreSQL, HSQL, MongoDB, SQLite, LotusNotes.
Typography	LaTeX, Endnote
Web Dev	HTML, CSS, RESTful, JavaScript, Apache Web Server, and Tomcat Web Server.

## Scholarship/Research Funding & Awards

### Scholarship

2009 – 2011	TUT/CSIR's, Master's Scholarship.	ZAR 30,000
2018 – 2021	CSIR-DST, PhD Bursary Support.	ZAR 360,000
2023	Google Conference Scholarships Africa	USD 3,000
	IEEE SMC 2023 Travel grants	USD 500

### Research Funding & Awards

2018,2019	Black in AI conference	USD 1,200
2020	Mozilla Foundation, Masakhane Web <sup>23</sup>	USD 5,000
2022	Co-PI: Transaction Capital: Vehicle Damage Estimation	ZAR 2,000,000
	Co-PI: JP Morgan AI Research <sup>4</sup>	USD 50,000
2023	exploreCSR Program	USD 18,000
	Cross-lingual Embedding model by Google	USD 25,000
	SIT Research Colloquium	ZAR 45,000
2024	Co-PI: AI4D African Languages Lab (IDRC  RDI)	CAD 1,070,500.00
2025	Co-PI: AfriGemma by Google	USD 200,000.00

## Postgraduate mentorship

### MIT<sup>5</sup> in Big Data Science (BDS)

2019–2021	Linae, Munsamy. MIT BDS. CS Department, University of Pretoria Supervisor & topic: Adversarial attacks on satellite imagery.
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<sup>2</sup>The Machine Translation Tool

<sup>3</sup><https://zenodo.org/records/4745501>

<sup>4</sup>Code-mixed and code-switched language for low-resource South African languages





<sup>5</sup>Master in Information Technology

## Postgraduate mentorship (continued)





2020–2022	<p>■ <b>Bayer</b>, Andreas. MIT BDS. CS Department, University of Pretoria Supervisor &amp; topic: The design and implementation of a domain-adaptive deep learning reinforcement learning for text classification.</p> <p>■ <b>Nthimo</b>, Liketso P. MIT BDS. CS Department, University of Pretoria Supervisor &amp; topic: Simulated Annealing approach to staff scheduling in a call centre.</p> <p>■ <b>Lusinga</b>, Moses. MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Predicting default for credit underserved community using machine learning.</p> <p>■ <b>Guga</b>, Nkosana. MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Detection of Online Transaction Fraud Using Unsupervised Machine Learning.</p> <p>■ <b>Noganta</b>, Khanyisa . MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Fake News Detection in social media: Using Machine Learning with Psycho-linguistic Features.</p>
	<p>■ <b>Gagiano</b>, Marc . MIT BDS Computer Science. CS Department, University of Pretoria Co-supervisor &amp; topic: Quantifying the valuation of vehicles based on damage.</p> <p>■ <b>du Preez</b>, Armo . MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Automating Sweet Potato Grading and Defect localisation: A YoloV5-based Intelligent Food Processing Grading System.</p> <p>■ <b>van Staden</b>, MH . MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Explainability for natural language processing.</p> <p>■ <b>Chinyati</b>, Tinashe . MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Computational Linguistics to Source code plagiarism.</p>
	<p>■ <b>Boikanyo</b>, Radiokana. MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Automatic Music Recommendation System using a hybrid CNN LSTM model .</p> <p>■ <b>Mapamela</b>, Salizwa Wendy . MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Automatic Music Recommendation System using a hybrid CNN-LSTM.</p> <p>■ <b>Kutshwa</b>, Bayanda . MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Enhancing Anomaly Detection in Transaction Networks through Cluster-Enhanced Graph Temporal Attention Networks.</p> <p>■ <b>Moyahabo</b>, Muriel Rabothata. MIT BDS Computer Science. CS Department, University of Pretoria Supervisor &amp; topic: Legal Text Classification for South African Supreme Court of Appeal Judgments Using Supervised Machine Learning and Deep Learning Techniques.</p>
	<p>■ <b>van Aswegen</b>, Robert. MIT BDS Computer Science. CS Department, University of Pretoria Co-supervisor &amp; topic: Enhancing statistical process control using hybrid deep learning: A Kolmogorov-Arnold and support-vector machine approach with adaptive multivariate generalised EWMA charts.</p>
2024–2026	

## Postgraduate mentorship (continued)

### Masters (MSc)






- 2022-2025     **Sindane**, Thapelo. MSc Computer Science. CS Department, University of Pretoria  
Co-supervisor & topic: Harnessing Cross-lingual Transfer Learning Techniques to Facilitate Interventions for Low-resourced Languages.
- 2023-2025     **De Jager**, Amica. MSc Computer Science. CS Department, University of Pretoria  
Co-supervisor & topic: Multimodal Misinformation Detection in the South African Social Media Environment.
- 2024-2025     **Mathebula**, Miehleketo. MSc Computer Science. CS Department, University of Pretoria  
Supervisor & topic: From Text Annotation to an Auto-Regressive Language Model for Sentiment Analysis in South African Financial Reviews.
- 2025-2027     **Shoderu**, Gabriel Olanrewaju. MSc Computer Science. CS Department, University of Pretoria  
Supervisor & topic: Digital Forensic Readiness to Mitigate Insider Threats in The Cloud Environment

### PhD


- 2025–current     **Mphogo**, Dinorego. PhD Computer Science. CS Department, University of Pretoria  
Supervisor & PhD topic: Multimodal Decision Networks for Unmanned Aircraft Encounter Modelling and Collision.
-  **Sindane**, Thapelo. PhD Computer Science. CS Department, University of Pretoria  
Co-supervisor & PhD topic: A multimodal solution for sign language recognition for low resource language.
-  **Wekwete**, Takura. PhD Computer Science. CS Department, University of Pretoria  
Co-supervisor & PhD topic: Application of deep reinforcement learning in asset liability management.
-  **Rananga**, Seani. PhD Computer Science. CS Department, University of Pretoria  
Co-supervisor & PhD topic: Deep learning techniques for detecting malicious threats to revolutionise cybersecurity.

## Selected publications





### Journal

- 2025     Sindane T, Marivate V, **Modupe A**: A Cross-lingual embedding methods and applications: A systematic review for low-resourced scenarios. Natural Language Processing Journal. 2025 June 9:100157.
-  Mathebula M, **Modupe A**, Marivate V, du Toit E. AI for ESG Governance in South Africa: A Systematic Review of Financial Intelligence Approaches. Available at SSRN 5443142.
- 2024     Mathebula M, **Modupe A**, Marivate V. ChatGPT as a text annotation tool to evaluate sentiment analysis on south African financial institutions. IEEE Access. 2024 Sep 20.
-  Mathebula M, **Modupe A**, Marivate V. Fine-tuning retrieval-augmented generation with an auto-regressive language model for sentiment analysis in financial reviews. Applied Sciences. 2024 Nov 21;14(23):10782.
-  Rananga, Seani, **Abiodun Modupe**, Abiodun Isong, and Vukosi Marivate. Misinformation detection: a review for high and low resource languages. (2024).










## Selected publications (continued)

- 2022     **Modupe A**, Celik T, Marivate V, Olugbara OO. Post-authorship attribution using regularized deep neural network. *Applied Sciences*. 2022 Jun 28;12(15):7518.

### Book Chapter



- 2023     Dlamini JS, Marshall L, **Modupe A**. Financial Inclusion in Sub-Saharan Emerging Markets: The Application of Deep Learning to Improve Determinants. In *Southern African Conference for Artificial Intelligence Research 2023* Nov 29 (pp. 219-236). Cham: Springer Nature Switzerland.
- 2023     De Jager A, Marivate V, **Modupe A**. Multimodal Misinformation Detection in a South African Social Media Environment. In *Southern African Conference for Artificial Intelligence Research 2023* Nov 29 (pp. 285-299). Cham: Springer Nature Switzerland.
- 2014     **Modupe A**, Olugbara OO, Ojo SO. Filtering of mobile short messaging service communication using latent Dirichlet allocation with social network analysis. In *Transactions on Engineering Technologies: Special Volume of the World Congress on Engineering 2013* 2014 Apr 27 (pp. 671-686). Dordrecht: Springer Netherlands.
- 2012     **Modupe A**, Olugbara OO, Ojo SO. Comparing Supervised Learning Classifiers to Detect Advanced Fee Fraud Activities on Internet. In *International Conference on Computer Science and Information Technology 2012* Jan 2 (pp. 87-100). Berlin, Heidelberg: Springer Berlin Heidelberg.

### Conference



- 2025     Marivate V, Dzingirai I, Banda F, Lastrucci R, Sindane T, Madumo K, Olaleye K, **Modupe A**, Netshifhefhe U, Combrink H, Nakeng M. Marito: Structuring and Building Open Multilingual Terminologies for South African NLP. *arXiv e-prints*. 2025 Aug:arXiv-2508.
- 2023     **Modupe A**, Celik T, Marivate V, Olugbara OO. Integrating Bidirectional Long Short-Term Memory with Subword Embedding for Authorship Attribution. In *2023 IEEE International Conference on Systems, Man, and Cybernetics (SMC) 2023* Oct 1 (pp. 1910-1917). IEEE.
- 2023     Rozina Myoya, Lesego Matojane, **Abiodun Modupe**, Vukosi Marivate and Albert Myburgh. Evaluating Drone Imagery for Wildlife Unique Feature Identification. *The Proceedings of SACAIR2023 Online Conference, the 4th Southern African Conference for Artificial Intelligence Research* ISBN : 978-0-7961-0851-7 (e-book)
- 2021     Nthimo L, Mokoena T, **Modupe A**, Marivate V. Call Centre Shift Schedule Optimisation using Local Search Heuristics. In *2021 IEEE AFRICON 2021* Sep 13 (pp. 1-6). IEEE.
- 2021     Lusinga M, Mokoena T, **Modupe A**, Marivate V. Investigating statistical and machine learning techniques to improve the credit approval process in developing countries. In *2021 IEEE AFRICON 2021* Sep 13 (pp. 1-6). IEEE.
- 2020     Marivate V, Sefara T, Chabalala V, Makhaya K, Mokgonyane T, Mokoena R, **Modupe A**. Investigating an Approach for Low Resource Language Dataset Creation, Curation and Classification: Setswana and Sepedi. In *Proceedings of the first workshop on Resources for African Indigenous Languages 2020* May (pp. 15-20).
- 2019     Sefara TJ, **Modupe A**. Yoruba gender recognition from speech using neural networks. In *2019 6th International conference on soft computing & machine intelligence (ISCMI) 2019* Nov 19 (pp. 50-55). IEEE.
- 2017     **Modupe A**, Celik T, Marivate V, Diale M. Semi-supervised probabilistics approach for normalising informal short text messages. In *2017 Conference on Information Communication Technology and Society (ICTAS) 2017* Mar 8 (pp. 1-8). IEEE.
- 2016     Diale M, Van Der Walt C, Celik T, **Modupe A**. Feature selection and support vector machine hyper-parameter optimisation for spam detection. In *2016 Pattern Recognition Association of South Africa and robotics and mechatronics international conference (PRASA-RobMech) 2016* Nov 30 (pp. 1-7). IEEE.







## Selected publications (continued)

- 2015     Adedamola AA, **Modupe A**, Dehinbo OJ. Development and evaluation of a system for normalizing Internet slangs in social media texts. In Proceedings of the World Congress on Engineering and Computer Science 2015 Oct 21 (Vol. 1, pp. 21-23).
- 2013     **Modupe A**, Olugbara OO, Ojo SO. Investigating topic models for mobile short messaging service communication filtering. In Proceedings of the world congress on engineering 2013 (Vol. 2, pp. 1-8).




### Workshop

- 2023     Myoya RL, Banda F, Marivate V, Modupe A. FINE-TUNING MULTILINGUAL PRETRAINED AFRICAN LANGUAGE MODELS. In 4th Workshop on African Natural Language Processing 2023.
- 2011     **Modupe A**, Olugbara OO, Ojo SO. Exploring support vector machines and random forests to detect advanced fee fraud activities on internet. In 2011 IEEE 11th International Conference on Data Mining Workshops 2011 Dec 11 (pp. 331-335). IEEE.


### Manuscript in Review

- 2025     Seani Rananga, Bassey Isong, **Abiodun Modupe** & Vukosi Marivate. Neural Machine Translation for Misinformation Detection in South African Languages, Submission to TRANSACTIONS ON ASIAN AND LOW-RESOURCE LANGUAGE INFORMATION PROCESSING (Undereview: TALLIP-25-0618.)
-  Seani Rananga, Bassey Isong, **Abiodun Modupe** & Vukosi Marivate. Neural Machine Translation for Misinformation Detection in South African Languages, Submission to TRANSACTIONS ON ASIAN AND LOW-RESOURCE LANGUAGE INFORMATION PROCESSING (Undereview: TALLIP-25-0618.)
-  Miehleketo Mathebula, **Abiodun Modupe**, Vukosi Marivate & Elda du Toit. AI for ESG Governance in South Africa: A Systematic Review of Financial Intelligence Approaches Intelligent Systems with Applications, Submission to INTELLIGENT SYSTEMS WITH APPLICATIONS. (Undereview: ISWA-D-25-01371.)
-  Sindane T, **Modupe A** & Marivate V. A Modern Lens into Sign Language Processing: A Review on Encoding Multi-modal Spatio-Temporal Input Using Transformers, Submission to ACM COMPUTING SURVEYS. (Undereview: ACM CSUR-2025-1316.)

## Editorial & Review Activities

Journal Reviewer	 IEEE/ACM TASLP, Machine Translation, LRE, SN Computer Science & Applied Sciences by MDPI, Humanities & Social Sciences Communications by Springer Nature
Conference & Workshop Organizer	 ICML, SCAIR (Program Committee: 2022-till date), AfricaNLP; ICCAIT 2023,2025, SAICSIT 2024 (Program Committee)
Shared Task Organizer	 SemEval 2023, 2024, 2025, 2026; WMT2023, 2024, 2025; IWSLT 2025



## Invited Talks/Colloquium

- June 2021     UP Research Workshop  
Topic: Exploring Word-Character Attention Model with Convolution for Authorship Authentication.  
Lynnwood Road, Hatfield. Pretoria.



## Invited Talks/Colloquium (continued)




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- March 2025     IEC (Conference and Exhibition) South Africa  
Topic: Foundations, Theory and Practice of E-Voting.  
Cape Town International Convention Centre,  
Cape Town SA.
-  AI in Science & Engineering Symposium  
Topic: All You Need Is Community.  
Ann Arbor, Michigan. USA
- June 2025     Panelist, UN/CAIR Data Commons Workshop





## Professional Membership/Affiliations

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### Affiliations




-  Black in AI
-  Deep Learning Indaba
-  Senior Member of DSFSI

### Membership

-  IEEE (95685929)
-  Stimson Responsible Fellow
-  Data Science Africa
-  Masakhane




## Languages

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- English     Proficient
- Yoruba     Proficient
- French     Basic

## Research/Online Profiles

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-  Google Scholar
-  ORCID
-  Scopus

## References

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Available on Request