

# Victor AKINWANDE

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## Education

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- **Carnegie Mellon University** **Rwanda**  
*Master of Science in Information Technology* *August 2016–May 2018*  
Thesis: Robot Learning from demonstration: An investigation into the use of Predictive Sequence Learning for Robot Manipulation.
- **University of Ilorin** **Nigeria**  
*Bachelor of Science in Computer Science* *September 2011–June 2015*  
Thesis: Automatic real-time pothole detection and traffic monitoring system using smartphone technology.

## Work Experience

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- **IBM Research | Africa** **Kenya**  
*Research Engineer, AI Science* *Jan 2019–Date*  
Research core AI algorithms and build AI tools to solve business problems. Design techniques such as anomalous pattern detection for neural network robustness, apply ML and causal inference algorithms to healthcare for maternal and neonatal child health outcomes, and build tools for explainability and fairness of ML models. Paper submissions to top AI conferences such as NeurIPS, ICLR, IJCAI, AAAI, KDD.
- **Oltranz** **Rwanda**  
*IT Consultant* *June 2018–December 2018*  
Designed and built back-end systems as well as infrastructure to help meet the scale and operational efficiency required by the company's technology solutions and portfolio of clients which included the Federal Tax Revenue Authority. Developed and deployed a public facing Application Programming Interface (API) for the Rwandan Meteorological Agency.
- **IBM Research | Africa** **Kenya**  
*Software Engineering Intern, Cognitive Healthcare* *September 2017–December 2017*  
Improved natural language processing techniques specifically Perplexity of neural language models for English language as spoken in East and West Africa applied to conversational agents in the health domain.
- **Data Systems Ltd.** **Rwanda**  
*IT Consultant* *May 2017–September 2017*  
Led the execution of a meal ordering application for Radisson Blu; an upscale, 290 sized international chain of full service hotels and resorts brand. Designed and developed a business-to-business platform to provide international market linkage for Agribusinesses in Africa.
- **N4Labs** **Nigeria**  
*Lead mobile developer* *September 2014–August 2016*

Led the team that developed mobile apps for top organizations in Africa including The Sun Newspaper, Education as a Vaccine – a globally recognized health NGO, and Funkythar; an online apparel marketplace.

#### **Visual Data Initiative**

**Nigeria**

- *Co-founder*

*June 2014–September 2015*

Winner of Social Entrepreneurs Initiative by Transparency International, 2014. Awarded a \$5,000 grant to retell public data towards driving accountability in governance in Nigeria.

#### **Hotels Booking Ltd. (hotels.ng)**

**Nigeria**

- *Software engineer*

*July 2014–September 2014*

Developed the API for third parties to programmatically make hotel reservations in over 5000 hotels in Nigeria. Led the development of the company's Android application.

### **Fellowships, Awards and Honors**

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- IBM Outstanding Technical Achievement Award, 2019 for contributions to Advancing Adversarial Robustness in AI Models
- IBM Research | Africa Technical Contributions Award, 2019
- IBM Great Minds student, 2017
- Innovators Forward Fellow, Carnegie Mellon University
- Winner of Social Entrepreneurs Initiative for West Africa by Transparency International, 2014
- 7 US patents related to robustness of deep-learning models and applications of AI

### **Technical skills**

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- Software engineering: Java, NodeJS, Python, C/C++
- Database management: Hbase, SQL, MongoDB
- DevOps & cloud computing: Kubernetes, Terraform, Hadoop, Spark, Linux
- Machine learning: NLP, Adversarial Robustness, Pytorch, Tensorflow
- Open-source contributions: IBM adversarial robustness toolbox.

### **Selected Professional activities and Service**

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- Organizing committee, DeepLearning Indaba 2019
- Co-organizer, TEDx Rugando, 2018. Kigali, Rwanda
- Organizer, Kigali AI Bootcamp, 2017 & 2018
- Vice-president, Data Science club, CMU-Africa, 2017
- Project lead for NASA International Space Apps Challenge 2015, Ilorin, Nigeria
- Finalist GITEX Student Lab competition 2014 & 2015 Dubai
- Delegate, UN Youth Consultation to the Annual High Level Dialogue on Democracy, Human Rights and Elections in Africa, Nairobi, 2014
- Community manager, Google Developers Group, University of Ilorin (2013 - 2015).

## Publications & Pre-prints

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Victor Akinwande. Security assessment of blockchain-as-a-service (baas) platforms. 2017.

Victor Akinwande et al. Automatic and real-time pothole detection and traffic monitoring system using smartphone technology. In *CoSRI*, 2015.

Victor Akinwande et al. Identifying audio adversarial examples via anomalous pattern detection. In *Workshop on Adversarial Learning Methods for Machine Learning and Data Mining, KDD'20*, 2020.

Victor Akinwande and Sekou L Remy. Characterizing the hyper-parameter space of lstm language models for mixed context applications. *arXiv preprint arXiv:1712.03199*, 2017.

Olayiwola Bello, Victor Akinwande, et al. Open data portals in africa: an analysis of open government data initiatives. *African journal of library, archives & information science*, 26(2):97, 2016.

Celia Cintas et al. Towards neural abstractive clinical trial text summarization with sequence to sequence models. In *2019 ICHI*, pages 1–3. IEEE, 2019.

Celia Cintas, Ramya Raghavendra, Victor Akinwande, et al. Decision platform for pattern discovery and causal effect estimation in contraceptive discontinuation. *IJCAI Demos*, 2020.

Celia Cintas, Skyler Speakman, Victor Akinwande, et al. Detecting adversarial attacks via subset scanning of autoencoder activations and reconstruction error. *IJCAI*, pages 876–882, 2020.

Joan Nkiriki and Victor Akinwande. Sustainability assessment of beccs (bioenergy with carbon capture & storage), 2017.

William Ogallo et al. Inspection of blackbox models for evaluating vulnerability in maternal, newborn, and child health. *IJCAI Demos*, 2020.

William Ogallo, Skyler Speakman, Victor Akinwande, et al. Identifying factors associated with neonatal mortality in sub-saharan africa using machine learning. *AMIA*, 2020.

Skyler Speakman et al. Deep mining: Detecting anomalous patterns in neural network activations with subset scanning. 2019.

## Patents

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- System and methods for training a lazy eye
- System and method for improving translation accuracy using targeted probes
- Goal-oriented conversation for Adverse Drug Reaction detection with code-mixed language, system and methods
- System and method for identifying adversarial attacks with advanced subset scanning
- Group Out-of-Distribution (OOD) detection by perturbation
- Method and system for selecting appropriate mode of reply from AI voice assistance systems against any voice command
- System and method for identifying generated/fake content with subset scanning over generative models activations.