

D'Jeff Nkashama

Curriculum Vitae

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Education

- 2021–Present **PhD in Computer Science**, *Université de Sherbrooke*, Canada.
Robust Deep Learning Models for Anomaly Detection.
- 2018–2019 **Master of Science in Applied Mathematics**, *University of the Western Cape*, South Africa, African Institute for Mathematical Sciences(AIMS) Structured Master's Program.
My project, "Search and Learn Strategies for Game Play," focused on applying reinforcement learning to two specific games, the Diplomacy game and the Iterated Prisoner's Dilemma, with the goal of training self-play agents to model opponent intents.
- 2014–2016 **Honours Degree in Computer Science**, *University of Kinshasa*, Kinshasa.
Project The title of my project was "Support Vector Machine for Intrusion Detection: Addressing the Unbalanced Classes Problem in Supervised Learning." In this project, I explored the use of support vector machines (SVMs) for intrusion detection, focusing on the challenge of unbalanced classes in supervised learning.

Experience

Vocational

- 2022 Jan–present **Teaching Assistant**, *Université de Sherbrooke*, Québec, Canada.
Introduction to AI (IFT615), Planification in AI (IFT702)
 - My primary responsibilities include helping students to better understand the subject matter.
 - Prepare assignments that aim to reinforce key concepts and deepen students' understanding of the course material.
 - Answer any questions that students may have while working on their assignments.
 - My goal is to provide students with the support they need to succeed in their academic pursuits and build a strong foundation in the studied subject.
- 2020 Jul–2021 Apr **Data Scientist**, *GSMA Mobile for Development Foundation*, London, UK.
The role consisted of working with mobile operators and the Congolese government to facilitate projects that apply mobile big data to help understand the situation and the impact of the COVID-19 disease and allow better and more timely decisions to be made.
- 2019–2020 **IT Developer**, *ITM Africa*, Kinshasa, DR Congo.
 - I worked as a full stack software engineer and data scientist at MKF Consulting DRC.
 - My responsibilities included developing software applications and conducting data analysis for clients.
 - As a full stack software engineer, I worked on both the front-end and back-end of software applications, using a range of programming languages and tools.
 - As a data scientist, I applied my skills in data analysis and modeling to help clients make data-driven decisions.
 - Through my work at MKF Consulting DRC, I aimed to deliver high-quality solutions that met the needs of clients and helped them achieve their business objectives.

2019 **Data Scientist**, *PubCell Sarl*, Kinshasa, DR Congo.

- Sep–Nov
- I collaborated with software developers on a project focused on data visualization and prediction for decision-making.
 - The project involved collecting and analyzing data related to people living with HIV in the Democratic Republic of Congo (DRC).
 - My role in the project was to contribute to the data analysis and visualization aspects of the project.
 - I worked closely with the software developers to ensure that the data was accurately interpreted and effectively presented to aid decision-making.
 - Through this work, I aimed to leverage data-driven insights to help improve the lives of people living with HIV in the DRC, and to support decision-making efforts that could ultimately lead to positive social change.

2016–2020 **Teaching Assistant**, *University of Kinshasa*, Kinshasa, DR Congo.

My role was to provide tutorship to computer science students on computer programming, operation research, and machine learning.

2016–2018 **Full Stack Software Developer(Part time)**, *SmartApps Company*, DR Congo/Kinshasa.

- Server Administration
- Lead Software Development Projects

Internship

2023 Feb–Sep **Intern**, *Desjardins*, Montreal/Canada, Data Scientist.

- Design, develop, and evaluate deep learning models for detecting suspicious activity in log data generated by the Desjardins ecosystem.
- Build, train, and optimize deep learning models using frameworks such as TensorFlow, Keras, or PyTorch.
- Integrate the models into the organization's security infrastructure and deploy them to monitor and detect suspicious activity in real time.
- Stay up-to-date with the latest developments in deep learning research and techniques, and propose new ideas for improving the accuracy and efficiency of the models.

2021 **Intern**, *Levio/Menya*, Sherbrooke/Canada, Data Scientist.

- May–Aug
- I provided advisory services to the Menya AI team regarding the development of an intrusion detection system for avionics networks.
 - My work involved analyzing traffic data from avionics networks and training machine learning models for intrusion detection in such networks.
 - I applied my expertise in machine learning to help the Menya AI team create an effective and accurate intrusion detection system.

2019 **Remote Intern**, *Montreal Institute for Learning Algorithms (MILA)*, Montréal/Canada.

- Jan–Aug
- I conducted research on Multi-Agent Reinforcement Learning (MARL) problems under the guidance of Professor Aaron Courville.
 - My work focused on exploring the challenges associated with MARL and identifying potential solutions to address these challenges.
 - As part of my research, I worked on developing and testing new algorithms for MARL, and I analyzed the performance of these algorithms through simulations and other experimental methods.
 - By collaborating with Professor Courville and other researchers in the field, I gained valuable insights and expertise that I could apply to future research projects and professional pursuits.

Miscellaneous

2021–present **Volunteer**, *Université de Sherbrooke*, Canada, Guide.

- As an integration assistant for new international students in Sherbrooke, my goal is to facilitate their successful integration into the local community.
- I offer various forms of assistance, including organizing on-campus activities and providing advice and guidance on living in Sherbrooke.
- I support students in their efforts to adapt to the local culture and provide them with the resources they need to thrive in their new environment.
- Despite the challenges posed by the pandemic, I strive to ensure that students feel welcome and supported both on and off-campus.

- 2018–2019 **Volunteer**, *Ikamva Youth*, South Africa/Cape Town, Tutor.
The core of the program is tutoring. I tutored high school learners in mathematics to ensure they understood their school work.
- 2014–2015 **Volunteer**, *Team Work Technology*, DR Congo/Kinshasa.
- I led a team that provided computing skills training to novice students, aimed at improving their programming and algorithmic skills.
 - As the head of the team, I oversaw the training program and ensured that it met the needs of the students.
 - In addition to my supervisory role, I also acted as a trainer, sharing my knowledge and expertise in computing to help students achieve their goals.

Honors and Awards

- Scholarship :- GRIC scholarship, 2021, 2022, 2023.
- MITACS, 2021, 2023.
 - ESMT-AIMS Scholarship for Business Management Training, 2019.
 - MasterCard Foundation Scholar, 2018.
- Awards :- Best Presentation at the Inaugural Conference at AIMS South Africa, 2019.
- Best Project from the ESMT Berlin-AIMS Training Presentation, 2019.

Computer skills

- Operating System : Linux, Windows, OSX.
- Programming Languages : Python, R, C/C++ .
- Framework : Tensorflow, Pytorch, Pandas.

Languages

- French: Native speaker.
- English: Professional proficiency.
- Lingala: Native speaker.

Publication

- 2023 Jean Marie Tshimula*, **D'Jeff K Nkashama***, Patrick Owusu*, Marc Frappier, Pierre-Martin Tardif, Froduald Kabanza, Armelle Brun, Jean-Marc Patenaude, Shengrui Wang, and Belkacem Chikhaoui. Characterizing financial market coverage using artificial intelligence. *19th International Conference on Machine Learning and Data Mining MLDM (under review)*, 2023.
- 2023 Jean Marie Tshimula, **D'Jeff K Nkashama**, Kalonji Kalala, Maximilien V Dialufuma, Mbuyi Mukendi Didier, Hugues Kanda, Jean Tshibangu Muabila, and Christian N Mayemba. Redesigning electronic health record systems to support developing countries. *7th International Conference on Medical and Health Informatics (ICMHI 2023)*, 2023.
- 2022 **D'Jeff K Nkashama**, Soltani Arian, Jean-Charles Verdier, Marc Frappier, Pierre-Martin Tardif, and Froduald Kabanza. Robustness evaluation of deep unsupervised learning algorithms for intrusion detection systems. In *Workshop on Machine Learning for Cybersecurity, International Conference on Machine Learning*, 2022.
- 2022 Thibaud Ecarot, **Djeff Kanda Nkashama**, Marc Frappier, and Pierre-Martin Tardif. The anomaly detection systems defense weaponry for internal cyber threats in industrial control systems. In *Industrial Control Systems Joint Working Group (ICSJWG)*, 2022.
- 2022 Maxime Alvarez*, Jean-Charles Verdier*, **D'Jeff K Nkashama***, Marc Frappier, Pierre-Martin Tardif, and Froduald Kabanza. A revealing large-scale evaluation of unsupervised anomaly detection algorithms. In *Workshop on Setting up ML Evaluation Standards to Accelerate Progress, International conference on learning representations*, 2022.

References

- **Jean-Marie Tshimula, PhD**, Researcher at the Université de Sherbrooke, Co-founder of Greprova.
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