# Kenneth EZUKWOKE, Ph.D

## PERSONAL INFORMATION

Kenneth EZUKWOKE, Ph.D
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## PROFESSIONAL OBJECTIVE

I am currently a Data Scientist at Datategy working on papAI product development. This comes after obtaining a Ph.D in Applied Mathematics-GenAI and Industrial Engineering from École Nationale Supérieure des Mines de Saint-Étienne, working on Artificial Intelligence for Failure Analysis in Semiconductor Industry 4.0- an industrial collaboration with STMicroelectronics, Bosch, and Infineon AG under the FA4.0 EURIPIDES2-PENTA project. My research is focused on improving Generative Artificial intelligence via Bayesian Inference and Causal Large Language Models (LLMs), for decision-making during Failure Root Cause Analysis (FRCA). Advised by Professor Mireille Batton-Hubert, Professor Xavier Boucher (both from EMSE) and Pascal Gounet and Jerome Adrian (both Physical Failure Analyst Engineers, STMicroelectronics).

## AWARDS

🏆 **Top 10 of 100+ teams**, AIRBUS Anomaly detection challenge,                    2020
*Top 10 of 100+ teams across France in the **AIRBUS** anomaly detection challenge. Modeling using Variational Autoencoder and Desity based clustering.*

🏆 **Summer Grant**, ACM SIGCHI Summer Grant,                    2019
***ACM SIGCHI** Summer Grant Recipient ACM Summer Grant. Summer school held in Barcelona, Spain, focused on user modeling and personalization in urban computing.*

🏆 **STUDENT RESEARCH GRANT**, UCL QATAR,                    2018-2019
*Student research grant awarded by UCL QATAR on data management system for UCL Qatar student-led event.*

🏆 **GOOGLE developer challenge scholarsip**, UDACITY Europe,                    2017
*Google Europe Udacity Scholarship recipient.*

🏛 **FIRST CLASS DISTINCTION**, VISTAS,                    2017
*Annual convocation ceremony Vels University.*

## EDUCATION

### Ph.D in Applied Math./Generative AI
École des Mines de Saint-Étienne (EMSE)

📍 Saint-Étienne, France
*Oct. 2020 - Sept. 2023*

- PhD candidate in Applied Math. / A.I, Researching GenAI for Failure Analysis FA4.0 EU Project
- An EU collaboration between EMSE, STMicroelectronics and Infineon Technologies AG with the objective of developing an AI-based solution for fault analysis in Microelectronics manufacturing industries of the future.

### M.Sc. Machine Learning and Data Mining [Bien (Good) ]
Université Jean Monnet (UJM) - Membre de l'Université de Lyon

📍 Saint-Étienne, France
*Sept. 2019 - Aug. 2020*

- Dual masters degree [MLDM] provides an original scientific position in Europe on problems related to machine learning, big data, pattern recognition, advance machine learning and advance AI.

### B.Sc. Computer Application [Distinction ]
Vels Institute of Science Technology and Advance Studies (VISTAS)

📍 Chennai, India
*June 2014 - May 2017*

- Bachelors focusing on Statistics, Calculus, Algorithms and Data structure, software/Application development. Final Thesis on designing a CRM application for student monitoring.

## ONLINE EDUCATION

### Foundations of machine learning - MEHRYAR MOHRI
New York University (Courant Institute and Google Research online)                    *2018*

- Regression, Convex optimization, kernel methods, Multi-class classification, Boosting, Reinforcement learning, Online learning, learning with finite and infinite hypothesis.

### Machine learning for financial trading
Georgia Tech University                    *2017*

- Deep learning algorithms, Machine Learning, Big data analysis and Stock prediction algorithms.

## PUBLICATIONS

K. Ezukwoke, H. Toubakh, A. Hoayek, M. Batton-Hubert, X. Boucher and P. Gounet, "Intelligent Fault Analysis Decision Flow in Semiconductor Industry 4.0 Using Natural Language Processing with Deep Clustering," *2021 IEEE 17th International Conference on Automation Science and Engineering (CASE)*, 2021, pp. 429-436, doi : 10.1109/CASE49439.2021.9551492 .

K. Ezukwoke, A. Hoayek, M. Batton-Hubert and X. Boucher, "GCVAE : Generalized-Controllable Variational AutoEncoder," *arXiv*, 2022, doi : 10.48550/ARXIV.2206.04225.

Z. Wang, K. Ezukwoke, A. Hoayek, M. Batton-Hubert and X. Boucher, "NLP based on GCVAE for intelligent Fault Analysis in Semiconductor industry," *IEEE International Conference on Emerging Technologies and Factory Automation (ETFA-2022)*, doi : 10.1109/ETFA52439.2022.9921524.

Ezukwoke, K., Hoayek, A., Batton-Hubert, M., Boucher, X., Gounet, P., and Adrian, J. (2022). Leveraging Pre-trained Models for Failure Analysis Triplets Generation. *arXiv*, doi : 10.48550/arXiv.2210.17497.

A. Rammal, K. Ezukwoke, A. Hoayek and M. Batton-Hubert, "Root cause prediction for failures in semiconductor industry, a genetic algorithm–machine learning approach," Scientific Reports 13(1), 4934, doi : 10.1038/s41598-023-30769-8.

## ACCEPTED

K. Ezukwoke, A. Hoayek, M. Batton-Hubert and X. Boucher, "GCVAE : Generalized-Controllable Variational AutoEncoder," ***BELIEF 2022. Poster.***

K. Ezukwoke, A. Hoayek, M. Batton-Hubert and X. Boucher, "$\beta$- Variational AutoEncoder and Gaussian Mixture Model for Fault Analysis Decision Flow in Semiconductor Industry 4.0," *European Network for Business and Industriall Statistics (ENBIS-21)*. **Poster**.

K. Ezukwoke, A. Hoayek, M. Batton-Hubert, X. Boucher and P. Gounet, "Big GCVAE : Decision-Making with Adaptive Transformer Model for Failure Root Cause Analysis in Semiconductor Industry *Journal of Intelligent Manufacturing (JIM)*.

## UNDER PEER-REVIEW

K. Ezukwoke, A. Hoayek, M. Batton-Hubert and X. Boucher, "GCVAE : Generalized-Controllable Variational AutoEncoder," *Journal of Machine Learning Research (JMLR)*.

K. Ezukwoke, A. Hoayek, M. Batton-Hubert, X. Boucher and P. Gounet, "FAGPT : Leveraging Pre-trained Models for Failure Analysis Triplet Generation." *Journal of Intelligent Manufacturing (JIM)*. **Accepted**.

## PROFESSIONAL EXPERIENCES

### Data Scientist- Generative AI
Datategy

📍 Paris, France
*Mar. 2024 - Present*

- Generative artificial intelligence technology development for papAI and other intelligent product for Industry 4.0 automation.

### Artificial Intelligence for Fault Analysis (FA4.0 EU Project)
STMicroelectronics

📍 Grenoble, France
*Oct. 2020 - Sept. 2023*

- Designing an A.I solution based on probabilistic graphical model for decision-making during failure root cause analysis observed during production of microelectronics.

### Machine Learning for Anomaly Detection on Complex Chemical Reactors
IFP Energies nouvelles

📍 Lyon, France
*Feb. 2020 - Aug. 2020*

- Analysis of complex sensor time-series to detect anomalies during process monitoring of a pilot plant. Develop an a posteriori automated machine learning algorithm for early anomaly detection. Analysis of complex sensors, trends and potential anomalies.

### DATA ANALYST/PYTHON DEVELOPER
Wölfel Engineering GmBH

📍 Wurzburg, Germany
*April 2018 - Aug. 2018*

- Algorithm design and implementation for handling Wind turbine data from Offshore Windpark.
- Data analysis and visualization using white label technology for in-house usage.

### DATA ANALYST/PYTHON DEVELOPER
Arun Cyber Technologies Ltd. (Startup Incubation Lab)

📍 Chennai, India
*Oct. 2016 - April 2017*

- Data analysis for detecting cyber threat, intrusion and maintenance.

**C# Software Developer**
Vels Institute of Science, Technology Advanced Studies

- C# Software Developer for digital software department.
- Customer Relationship Management (CRM) software developer for Parent Student Monitor.
- University Database management system maintenance.
- SQL programming for database management.

SERVICE

**Reviewer :** *WiML, IEEE CASE, EMNLP, AISTATS, ACL.*

AFFILIATIONS

**Organizations :** *CNRS UMR-6158 LIMOS, Blacks in AI, Masakhane.*

VOLUNTEERING

**The 10th International Conference on Learning Representations**
**ICLR**. Sponsors : Meta, DeepMind, Google Research, Byte Dance, Microsoft
📍 Virtual
*Apr. 25-29, 2022*

**The 25th International Conference on Artificial Intelligence and Statistics**
**AISTATS**. Sponsors : G-Research, Google DeepMind, Facebook AI
📍 USA. [Virtual]
*March 28-30, 2022*

**IEEE International Conference on Automation Science and Engineering**
**IEEE CASE**. Sponsors : IEEE, EMSE, INSA, IMT, LIMOS
📍 Lyon, France
*Aug. 23-27, 2021*

**Mentor on AI for Coral Reef Conservation in the Vamizi Island**
Sponsors : Sida, K4A, IDRC-CRDI Canada, UNESCO-IRCAI
📍 Mozambique
*Oct. 2020 - 2021*

**The 24th International Conference on Artificial Intelligence and Statistics**
**AISTATS**. Sponsors : G-Research, Google DeepMind, Facebook AI
📍 USA. [Virtual]
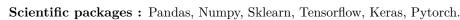*April 13-15, 2021*

SKILLS

**Operating systems :** Linux, Windows.

**Programming languages :** Python, Bash, R, MATLAB.

**Office softwares :** LaTeX, Libre Office, Microsoft Office, Open Office.

**Scientific packages :** Pandas, Numpy, Sklearn, Tensorflow, Keras, Pytorch.

**Web applications :** Django, Flask, Plotly Dash, Bokeh, Git.

**Optimization :** Algorithmic and convex optimization.

**Languages :** English, French.

**Independent projects :** Kernel methods, Cheese-coin (blockchain), Graph mining, Forecasting 1.0.

INVITED TALKS

**Plate-Forme Intelligence Artificielle (PFIA-22)**
Presentation : Artificial intelligence for Fault Analysis in Semiconductor Industry
Highlight : GCVAE with Transformers for structured data generation.
📍 Saint-Étienne, France

TEACHING EXPERIENCE

**Big data clustering**
École des Mines de Saint-Étienne (EMSE)
📍 Saint-Étienne, France
January, 2022

**Introduction to Natural Language Processing (NLP)**
École des Mines de Saint-Étienne (EMSE)
📍 Saint-Étienne, France
January, 2022

**Deep Learning practical class**
École des Mines de Saint-Étienne (EMSE)
📍 Saint-Étienne, France
2021

Last updated, **9 mars 2024**.