Name: **Yves Matanga**

Role: **Research and Technology Specialist, PhD**

Expertise

- PhD in Electrical Engineering, Optimisation Theory, Control Systems, Artificial Intelligence
- Data Scientist – Supervised and Unsupervised Learning, Reinforcement Learning, Text Analysis
- Embedded Electronic Engineer – Microcontroller programming and Embedded Systems Design
- Technical Programmer - Scientific Computing in MATLAB and Python
- Software Developper – C#. NET, .NET MAUI Mobile Dev, .NET MVC, SQL, Java EE

Research Domain

- Global Optimisation, Metaheuristics (PSO, DE, GA), Branch and Bound Frameworks, Interval Analysis
- Control Theory, Classical and Fractional PID tuning, Nonlinear System Identification, Optimal Control
- Machine Learning, Unsupervised and Supervised Learning, Dynamic Programming, Linear Regression, Decision Trees, Support Vector Machines, Naïve Bayes, Logistic Regression, Ensemble Learning, Neural Networks and Deep Learning, FFN, CNN, Dimensionality Reduction – PCA, Clustering – Kmeans & Hierarchical Clustering
- Natural Language Processing, Text Analysis – TFIDF

Technology Stack

- Python – Pandas, Scikit-learn, Numpy, Matplotlib, Seaborn – MATLAB
- C# - .NET MVC, .NET MAUI, C# core, Database
- Java – JAVA SE, Java EE, Multithreading, Sockets, RMI, Database
- SQL – Querying, and Stored Procedures, MySQL, SQLite, Postgres
- AVR – Arduino, ALTERA FPGA/VHDL, C/C++

Technical Projects

- Development of a Non-invasive Endogenous Brain Computer Interface for Cursor Control, 2017
- Development a Distributed Mobile-Web Social Ecommerce Infrastructure, 2023-2024

Research Publications

- **N. Y. Matanga**, K. Djouani, A Kurien, “A Matlab/Simulink framework for real-time implementation of endogenous brain computer interfaces”, 13th IEEE Africon Conference, September 2017
- **N. Y. Matanga**, K. Djouani, A Kurien, “Analysis of User Control Attainment in SMR-based Brain Computer Interfaces”, Innovation and Research in Biomedical Engineering, Elsevier, September 2018
- **N. Y. Matanga**, Y. Sun, Z Wang, “Hybrid PSO-αBB global optimisation for C2 box-constrained multimodal NLPs”, IEEE Access, IEEE, December 2021
- **N. Y. Matanga**, Y. Sun, Z Wang, “Nonlinear optimal control using sequential niching differential evolution and parallel workers”, Journal of Advanced in Information Technology, November 2022

- **N. Y. Matanga**, Y. Sun, Z Wang, “Globally convergent Fractional Order PID tuning for AVR systems using sequentially niching metaheuristics”, 7th ICRAE IEEE International Conference on Robotics and Automation Engineering, November 2022
- **N. Y. Matanga**, Y. Sun, Z Wang, “Nonlinear system identification using a semi concurrent sequential niching framework”, 7th International Conference on Computer Science and Artificial Intelligence, December 2023
- **N. Y. Matanga**, “Analysis of Control Attainment in Endogenous Electroencephalogram based Brain Computer Interfaces”, Tshwane University of Technology, October 2017, Masters Dissertation
- **N. Y. Matanga**, “Convergence improvement in Global optimisation with applications to control systems”, University of Johannesburg, December 2022, PhD Thesis