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 Stack**

* 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, 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](http://journalinsights.elsevier.com/journals/0208-5216), 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