MERCEL VUBANGSI

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MACHINE LEARNING / AI ENGINEER

Results-driven Machine Learning Engineer with 7 years of experience in designing, developing, and deploying machine learning models in production. Specializing in large language models (LLMs) and cloud-based AI solutions, with a proven ability to integrate deep learning frameworks into scalable applications. Proficient in Python, MLOps, and cloud technologies, managing the full ML lifecycle from data preprocessing to deployment and monitoring. Skilled in using AI to enhance automation, efficiency, and business intelligence. Strong collaborator with excellent communication skills, aligning technical solutions with business goals.

• Neural Networks • Data Analysis • Statistical Modeling • Data Visualization • Database Design • Web Development
• Cloud Computing • Large Language Models (LLMs) • MLOps • Predictive Analytics • Business Intelligence

Languages: Python, JavaScript
Web: HTML5, CSS3, JSON
Web Services: AWS, GraphQL, RESTFul
Web/App Servers: Apache, Tomcat
Frameworks: Flask, Django, NodeJS, ReactJS
Databases: MySQL, DynamoDB, MongoDB, Redis, Firebase
Design Patterns: MVC, Singleton, Factory, Observer, Facade, Proxy, Prototype, Dependency Injection
SDLC: Agile, Scrum, Iterative, CI/CD
Tools: Maven, Gradle, Eclipse, GitHub, Slack, Kubernetes, AWS, Docker, GitLab, Terraform
Platforms: Windows, Linux, Mac OS
Big Data: Apache Spark, Apache Kafka, Snowflake, Elasticsearch, Tableau, Power BI, SQL, NoSQL
Application/Software: Mathematica, Matlab

PROFESSIONAL EXPERIENCE

CAREER NOTE: *Completed on-campus studies and currently taking distance education courses to complete a* ***Master's Degree in Computer Science*** *(Available for full-time, W-2 employment).*

International Research Center for AI And IoT, Nicosia, North Cyprus • 07/2022 – 08/2024
A leading research institution specializing in AI and IoT solutions for industries such as healthcare and cybersecurity.

AI/ML Engineer
Developed & deployed cloud-based AI/ML solutions integrating AWS technologies for scalable analytics and automation.

- Designed and deployed a healthcare chatbot on Amazon SageMaker with Python and TensorFlow, implementing NLP capabilities that reduced patient response times by 20% and improved user satisfaction by 15%.
- Built an IoT-driven predictive maintenance system using AWS Lambda, DynamoDB, and Python, which analyzed sensor data to predict equipment failures and optimize maintenance schedules.
- Developed a real-time anomaly detection engine using AWS Kinesis, XGBoost, and Python, which processed streaming data to identify threats with 95% accuracy and reduced false positives by 30%.
- Integrated CI/CD pipelines using AWS CodePipeline, Docker, and Jenkins to automate the deployment of machine learning models, streamlining the deployment process and improving team efficiency.
- Implemented model explainability features using SHAP (SHapley Additive exPlanations) and AWS SageMaker, providing interpretable insights into model predictions to enhance stakeholder understanding and trust.
- Optimized a large-scale recommendation system using Apache Spark, AWS EMR, and PyTorch, improving recommendation accuracy and user engagement across the platform.

Technologies Used: *AWS SageMaker, AWS Lambda, AWS Kinesis, Docker, SHAP, PyTorch, Tensorflow, Python.*

COMPUTATIONAL MATERIALS SCIENCE LABORATORY, Bambili, Cameroon • 12/2019 – 03/2022
A research lab specializing in advanced materials modeling and high-performance simulations.

Computational Scientist/Software Engineer
Developed computational models for material properties and implemented efficient simulation algorithms.

- Simulated semiconductor nanostructures using Python and LAMMPS, optimizing simulation parameters and algorithms to improve accuracy by 15% and reduce computational overhead by 10%.
- Developed a high-performance molecular dynamics engine using C++ and MPI, implementing parallel computing techniques that reduced simulation time by 20% for large-scale material systems.
- Built a machine learning model using Scikit-learn and Python for material property prediction, leveraging feature engineering and hyperparameter tuning to improve prediction accuracy by 5%.

- Created real-time data dashboards using Flask and D3.js, designing interactive visualizations for simulation results that improved data accessibility and user engagement.
- Integrated version control with GitHub and automated CI/CD workflows using Jenkins, streamlining code deployment and reducing manual errors in the development process.

Technologies Used: *Python, LAMMPS, C++, Scikit-learn, Flask, D3.js, GitHub.*

Condensed Matter, Electronics, And Signal Processing Laboratory, Dschang, Cameroon • 07/2017 – 12/2019
A research facility of the University of Dschang focusing on quantum physics, electronic properties, and signal processing.

Computational Scientist
Developed computational models and signal processing algorithms for condensed matter experiments

- Built signal processing algorithms in MATLAB, optimizing Fourier transform and filtering techniques to reduce analysis time by 30% and improve data resolution.
- Simulated quantum transport properties using Python and Quantum Espresso, implementing advanced algorithms to enhance predictive accuracy and reduce computational costs.
- Developed a spectroscopy data classifier using TensorFlow and Python, leveraging convolutional neural networks (CNNs) to achieve 92% accuracy and improve classification reliability.
- Automated data acquisition workflows using LabVIEW, designing custom scripts and interfaces to streamline data collection and reduce manual effort.

Technologies Used: *MATLAB, Python, Quantum Espresso, TensorFlow, LabVIEW, PostgreSQL, Cron*

FREELANCE EXPERIENCE

Cyprus Massachusetts Center for Innovation, Nicosia, North Cyprus • 03/2022 – 07/2022
A technology innovation hub providing innovative digital solutions for startups and educational institutions.

Full Stack Engineer
Designed and implemented full-stack applications from School Management System to streamline academic operations.

- Developed a comprehensive School Management System using React and Node.js, streamlining student and staff management workflows and improving overall operational efficiency.
- Built RESTful APIs with Express and MongoDB to handle student records, attendance, and scheduling, increasing data processing speed by 30% and reducing API response times by 20%.

Technologies Used: *React, Node.js, Express, AWS Elastic Beanstalk, JWT, Stripe API, Material-UI, GitHub Actions.*

ACADEMIC PROJECTS

Maharishi International University (2025)
Diet Recommendation System: Developed a machine learning-based diet recommendation system that creates personalized meal plans based on user data like age, weight, and activity level. Built with Python, Flask, and Scikit-learn, it includes a user-friendly interface, nutritional database, and progress tracking for feedback on eating habits.

PERSONAL PROJECTS

AI-enabled digital campus system (2024): The AI-enabled digital campus system uses AI, machine learning, and IoT to optimize resources, predict student needs, and enhance campus operations with real-time data. It features mobile apps, biometric authentication, and communication tools like chatbots and video conferencing. Focused on data security, it integrates with existing campus systems for efficient, secure management.

EDUCATION

Master of Science in Computer Science
(In progress via distance education; expected completion 04/2027)
Maharishi International University, Fairfield, Iowa

Key Courses: Enterprise Architecture, Software Engineering, Algorithms, Cloud computing

Master of Science in Artificial Intelligence Engineering
Near East University, Nicosia, Mersin 10 (06/2023)
Key Courses: AI and Blockchain, AI and Cloud computing, AI and Internet of things

Bachelor of Technology in Software Engineering
HIBUMS Polytechnic, Bafoussam, West Region (12/2020)

PhD Computational Physics
University of Dschang (ENS Annex Bambili), Bambili, North West Region/Cameroon (08/2017)

Master of Science in Computational Physics
University of Dschang, Dschang, West Region (07/2012)

Bachelor of Science in Physics
University of Yaounde I (ENS Annex Bambili), Bambili, North West Region/Cameroon (08/2005)