

# Taha Abdelazziz Rahmani

## Publications

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<b>Real-Time AI-Powered Monitoring for Energy-Efficient Scheduling in Multi-Node Heterogeneous Systems</b>	<b>F.G.C.S</b> Journal, ScienceDirect (Accepted with revisions)
<b>Equalizer: Energy-Efficient Machine Learning-Based Heterogeneous Cluster Load Balancer</b>	<b>C.C.P.E.</b> Journal, Wiley (2024)
<b>Machine Learning-Driven Energy-Efficient Load Balancing for Real-Time Heterogeneous Systems</b>	<b>Cluster Computing</b> Journal, Springer (2024)
<b>RTL_B_Sched: Real Time Load Balancing Scheduler for CPU-GPU Heterogeneous Systems</b>	<b>ICSCA, IEEE</b> conference (2023)
<b>HBalancer: A machine learning based load balancer in real time CPU- GPU heterogeneous systems</b>	<b>IIICT, IEEE</b> conference (2022)

## Experience

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<b>UMONS   FPMs-ILIA laboratory</b> – Ph.D Researcher <b>Ph.D mobility program</b>	<b>Mons, Belgium</b> Oct 2023 – Sep 2024
<ul style="list-style-type: none"><li>• <b>Mission:</b> Developing dynamic load balancing strategies for Distributed Deep Learning Workloads Across Distributed Heterogeneous Systems.</li><li>• <b>Thematics:</b> Python, Pytorch, Horovod, MPI, Tesnsorflow, CPU, GPU</li></ul>	
<b>UMONS   FPMs-ILIA laboratory</b> – Ph.D Researcher <b>Research Visit</b>	<b>Mons, Belgium</b> Feb 2023 – Mar 2023
<ul style="list-style-type: none"><li>• <b>Mission:</b> AI-driven Resource Allocation and Data Management in Multi-node Heterogeneous Systems.</li><li>• <b>Thematics:</b> C/C++, OpenCL, Python, LLVM, Clang, Perf, Pytorch, Tensorflow, Keras, Scikit-learn, Load Balancing, Load Monitoring</li></ul>	
<b>University of ORAN1 AHMED BEN BELLA</b> – Teaching Assistant	<b>Oran, Algeria</b> Oct 2022 – May 2023
<ul style="list-style-type: none"><li>• <b>Mission:</b> Teach practical sessions for bachelor students<ul style="list-style-type: none"><li>– C Language: Algorithms and data structures</li><li>– Python language : Applied mathematics methods</li></ul></li></ul>	

## Education

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<b>University of Umons</b> , Ph.D Mobility Researcher	Sep 2023 to Sep 2024
<b>University of Oran1 Ahmed Ben Bella</b> , Ph.D   Intelligent Resource Management in Distributed Heterogeneous Systems (CPU/GPU)	Apr 2021 to Jul 2024
<b>University of Oran1 Ahmed Ben Bella</b> , Master   Parallel, Embedded and Industrial computing science	Oct 2018 to Sep 2020
<b>University of Oran1 Ahmed Ben Bella</b> , Bachelor   Computer Science/Information System	Sep 2015 to Jun 2018

## Projects

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### Framework for scheduling applications on multi-node CPU/GPU cluster

- **Programming Tools:** Python, C/C++, LLVM, Clang, OpenCL, Tensorflow, Keras, Scikit-learn, Bash
- Designed and developed a **scheduling framework** for optimizing the execution of **OpenCL** applications on real-time multi-node clusters using **Python, Bash, C/C++**
- Achieved over **6x** improvement in **response time** and system **throughput**, while reducing **energy** consumption by up to **75%**
- Developed an **AI-based monitoring mechanism** to respond to system dynamic changes using **Python, Tensorflow, Keras, and Scikit-learn**
- Developed an OpenCL applications' **feature extractor** script using **Python, LLVM, CLang, and Regex** to extract features used by AI models

### Tuning a PID Controller using AI methods for non-linear systems

- **Programming Tools:** Python, Matlab, Simulink, SimuPy, PyQt, OpenCV
- Implemented CMA-ES evolutionary algorithm for tuning PID controller of an Inverted Pendulum using **Matlab and Simulink**
- Achieved **enhanced stability** of the inverted pendulum system, ensuring **rapid convergence** to its upright position.
- Developed a **graphical application** for visualising the inverted pendulum solution **Python, PyQt, and OpenCV**

### Development of a University Administration Management Website

- **Programming Tools:** Django, Python, JavaScript, HTML, CSS, Bootstrap
- Design and implementation of a **dynamic web application** for automating computer science department services management and interdepartmental exchanges using **Python, Django, HTML, CSS, Javascript, PostgreSQL**

## Skills

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**Programming Languages:** C++, C, Python, Java, JavaScript, Matlab

**Operating Systems:** Linux, Windows

**AI frameworks:** Scikit-learn, Keras, Tensorflow, Pytorch

**HDL:** Verilog, VHDL

**Simulation:** SystemC, Arena

**Data Bases:** MySQL, PostgreSQL

**Web Technologies:** HTML5, XML, CSS, Django, Bootstrap

**General Tools:** Git, Latex

## Languages

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**English:** C1

**French:** C2 (TCF)

**Arabic:** Native speaker