



Silesian  
University  
of Technology

**ALEXANDRE NIYOMUGABA**



RESEARCH  
UNIVERSITY

EXCELLENCE INITIATIVE

Ministry of Science  
and Higher Education

# INTRODUCTION OUTLINES

- Country of origin
- Academic background
- Expertise
- Scientific contributions
- Research paradigm
- My role in TUA1 project
- My contact

# FROM THE REPUBLIC OF RWANDA



Culture



Highland Biodiversity

# ACADEMIC BACKGROUND

A wide-angle photograph of a university campus. In the foreground is a large green lawn. To the left is a long, two-story building with a blue roof and many windows. To the right is a taller, modern building with a brick and yellow facade, featuring a large glass entrance and a sign that reads "POSTGRADUATE BLOCK". In the background, there are rolling green hills and a large mountain under a cloudy sky. A semi-transparent text box is overlaid on the center of the image.

Assistant Lecturer  
INES RUHENGIRI- Institute of Applied Sciences  
Faculty of Sciences and Information Technology  
Department of Computer Science

# EXPERTISE



The transformation of traditional appliances into smart, responsive systems through the design of an IoT-based intelligent gas stove for domestic users, equipped with remote control features and real-time monitoring capabilities to enhance safety, optimize energy usage, and enable proactive fault detection.

# EXPERTISE

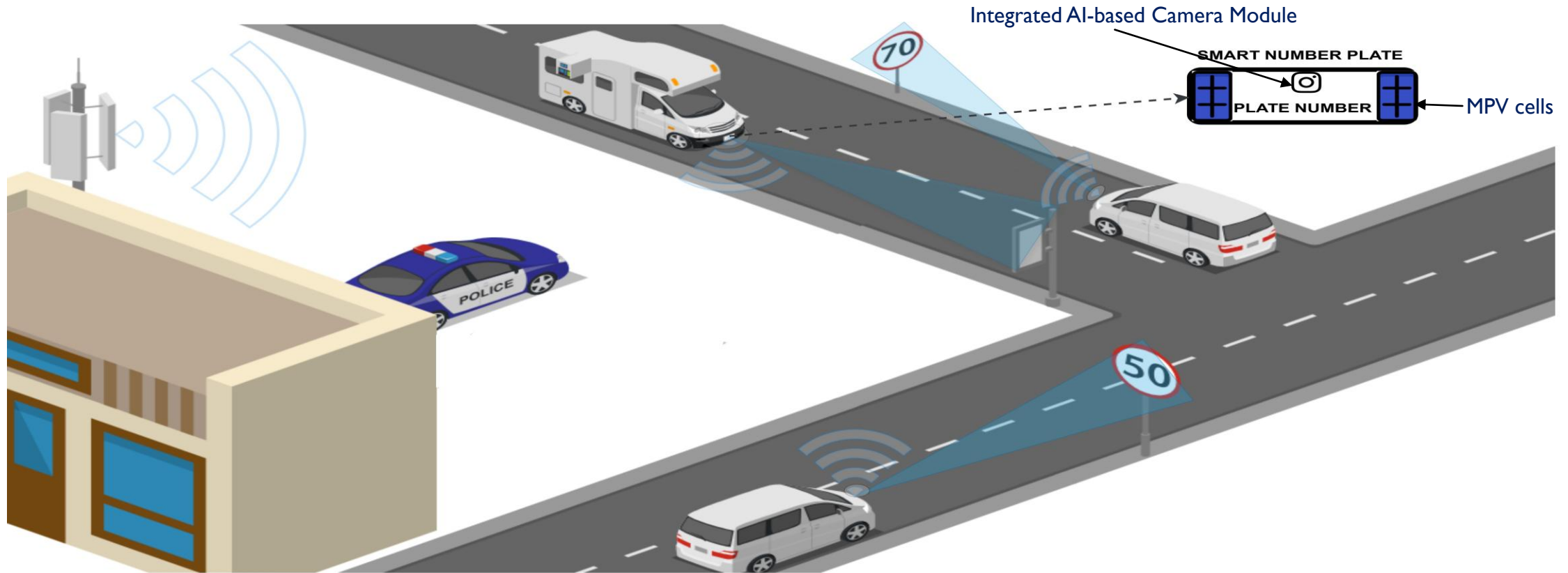
2024 | OriginalPaper | Chapter

## The Artificial Neural Network-Based Smart Number Plate for Vehicles with Real-Time Traffic Signs Recognition and Notification

Authors: Alexandre Niyomugaba, Neema Mduma, Kisangiri Michael

Published in: Artificial Intelligence Tools and Applications in Embedded and Mobile Systems

Publisher: Springer Nature Switzerland



# SCIENTIFIC CONTRIBUTIONS

## Edge-Optimized Hybrid DNNs for Efficient High-Dimensional Visual Anomaly Detection in Industrial Federated Learning Environments

Authors: Alexandre Niyomugaba, Dariusz Mrozek

## Fuzzy Querying in the Cloud-based Environment for Data Stream-driven Predictive Maintenance in AGV-enabled Smart Factories

Publisher: **IEEE**

[Cite This](#)



Bożena Małysiak-Mrozek ; Dominik Romanów ; Piotr Grzesik ; Paweł Benecki ; Alexandre Niyomugaba ; Theodore Habimana [All Authors](#)

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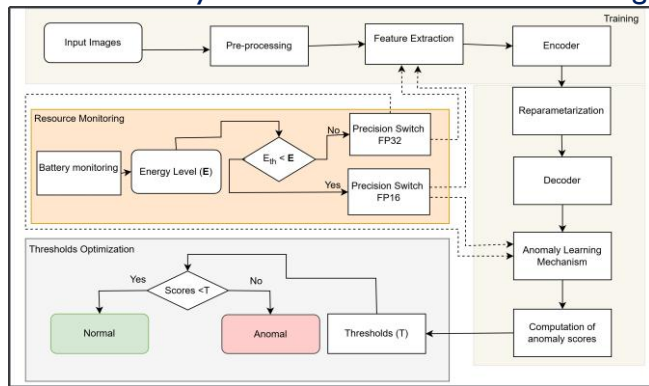
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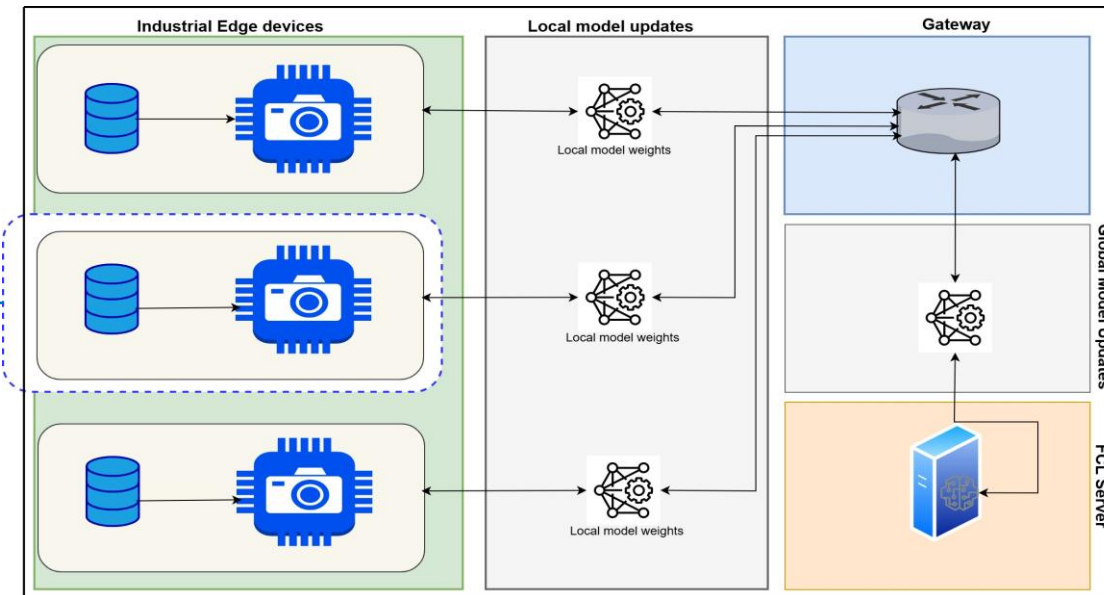
# MY RESEARCH PARADIGM

## GPU-Accelerated Edge-based federated learning architecture for industrial anomaly detection

Anomaly detection architecture at the edge



Industrial Federated learning Architecture

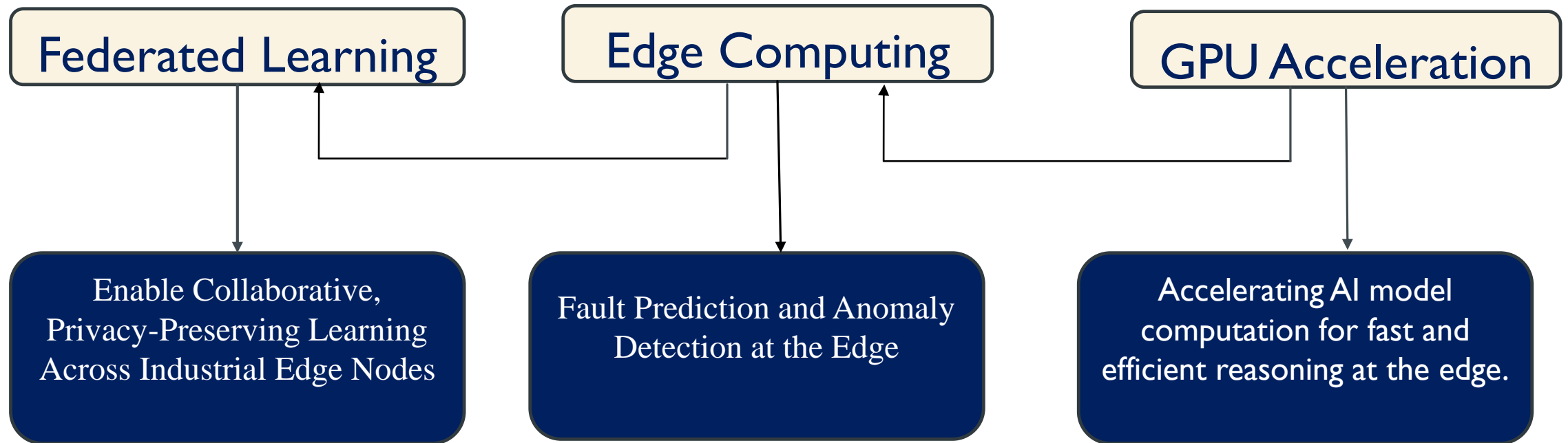


Industrial Architecture



# MY ROLE IN TUA AI PROJECT

Project Title: GPU-accelerated Edge computing for Federated Learning reasoning in industrial environments



# MY CONTACT

X account



WhatsApp



# Thank you