# Mulat Tiruye

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## Professional Summary

Ambitious and technically proficient Master's student in Computer Engineering with expertise in VLSI design, software development, cloud computing, and AI-driven systems. Proven ability to optimize hardware and software systems, enhance AI applications, and analyze performance metrics. Seeking PhD opportunities to advance knowledge in VLSI, AI hardware acceleration, high-performance computing, and cloud computing solutions.

## Education

**University of Pisa -** Pisa, Italy | 09/2023 – Present

MSc in Computer Engineering

- **Relevant Coursework**: Cloud Computing, AI and Intelligent Systems, Advanced Network Architectures, Software Systems Engineering, Distributed Systems, Cybersecurity, Database Systems
- **Focus Areas**: High Perfomance Computing, Artificial Intelligence, Networking Solutions, AI-Driven Hardware Acceleration, Cloud Infrastructure, And Software Engineering.

**SUTD & Chang Gung University** - Singapore/Taiwan | 09/2021 – 03/2023

Master of Engineering and Science in Nano Electronics Engineering and Design

- Dissertation: *Dual Mode Systolic Array-Based Processing Element for CNN Accelerator*
- Graduated with First Class Honors (GPA: 3.75/4)

**KIIT University** - India | 07/2017 – 08/2021

B. Tech in Electronics and Electrical Engineering

- Graduated with First Class Honors (GPA: 9.22/10)

## Skills

- **Programming Languages**: Python, Java, C++, Verilog, VHDL, JavaScript, HTML, CSS.
- **AI & Machine Learning** : PyTorch, TensorFlow, Keras, DNN, CNN, Neural Networks.
- **Cloud Computing**: AWS, Google Cloud Platform (GCP), Hadoop
- **Networking**: TCP/IP, OSPF, DNS, VLAN, VPN, Network Security, Cloud Networking
- **VLSI & FPGA Development**: Xilinx Vivado, Cadence Virtuoso, RTL Design, IC Design
- **Software Development**: Full-stack development, REST APIs, Database Systems
- **Database Management**: MongoDB, MySQL, PostgreSQL.
- **Soft Skills**: Leadership, Team Collaboration, Research & Analysis, Written and Oral Communication

## Research Interests

- **Networking**: High-performance network architectures and cloud networking solutions.
- **Artificial Intelligence and Machine Learning:** Applications in AI-driven hardware, embedded systems, and data analytics.
- **High-Performance Computing Processors**: Design and optimization of processors for high-performance computing (HPC).
- **Cloud Computing:** Designing scalable cloud infrastructure for AI and distributed systems.
- **VLSI Design and Embedded Systems:** Hardware acceleration for AI and real-time systems.
- **Software Development**: Scalable software systems, including AI integration and distributed architecture.

## Professional Experience

Singapore University of Technology and Design | Jun 2022 – Mar 2023

- Increased student engagement by 25% through hands-on electronics labs and AI exercises.
- Improved model training efficiency by 15% using optimized data preprocessing techniques in Python.

## Project

**AI-Based Intelligent System (In Progress)**

July 2024 – Present

- Designing an AI-driven intelligent system aimed at optimizing decision-making and improving system efficiency through machine learning algorithms.
- Developing the system using Python, PyTorch and TensorFlow, focusing on real-time data analysis and performance metrics.
- Expected to enhance overall system performance by 20% upon completion by integrating predictive modeling techniques.

**Cybersecurity Bulletin Board System (In Progress)**

May 2024 – Present

- Developing a Bulletin Board System (BBS) focusing on cybersecurity, designed to ensure secure communication and data protection.
- Implementing security protocols such as encryption and access control mechanisms to safeguard sensitive information.
- Anticipated to reduce security vulnerabilities by 30% through advanced cybersecurity frameworks and encryption standards.

**Cloud-Based Letter Counting System**

May 2024 – Jul 2024

- Created a cloud-based system using Hadoop to analyze large datasets, reducing processing time by 20%.

- Designed and executed on virtual machine using java language, ensuring scalability and efficiency for big data applications

**Object Recognition Using Yolov5**

Mar 2024 – May 2024

- Achieved an 18% improvement in recognition accuracy by developing and optimizing a CNN-based object recognition model using Python and TensorFlow and PyTorch.

**Database Management System: CineLink Platform**

Nov 2023- Feb 2024

- Designed and developed a database management system for the CineLink platform, storing and referencing a large dataset of movies.
- Utilized NoSQL (MongoDB and Neo4j) databases to manage and store over 12,000 movies and 10,000 user profiles, optimizing data retrieval by 30%.
- Enhanced the user experience by integrating movie recommendations and personalized watchlists, reducing query times by 15% through database optimization.

**High-Speed PLL Design for AI Applications**

Apr 2022 – Jun 2022

- Developed a Phase-Locked Loop (PLL) achieving 155 MHz stability, reducing jitter by 20% for AI hardware applications.
- Simulated and verified using LTSPICE.

**High Gain Op-Amp Design**

Nov2021- Jan 2022

- Designed and simulated an operational amplifier (Op-Amp) to analyze stability and optimize performance.
- Achieved a gain of 106dB, improving circuit stability for high-gain applications by 20%.
- The design is suitable for high-gain circuit systems, enhancing performance in precision analog applications.

## Publication

- **MA Tiruye**, OB Gerba, T.Hui Teo. "A 155 MHz Low-Jitter PLL for Enhanced Signal Integrity in High-Speed Interconnects". IEEE. [2024]
- **M.A. Tiruye**. "Dual Mode Systolic Array-Based Processing Element for CNN Accelerator." Chang Gung University Library, 2023.
- Shi Hui Chua, T. Hui Teo, **Mulat Ayinet Tiruye**, I-Chyn Wey. "Systolic Array-Based Convolutional Neural Network Inference on FPGA". IEEE. [2023]
- Tan Rong Loo, T. Hui Teo, **Mulat Ayinet Tiruye**, I-Chyn Wey (2023). "High-Performance Asynchronous CNN Accelerator with Early Termination". IEEE. [2023]

## Awards and Scholarships

- **MAECI Scholarship**, Italian Government, August 2023 to July 2025
- **NEED Scholarship**, SUTD, August 2021 to March 2023
- **Betere Science Scholarship**, Ethiopian Government, September 2017 to October 2021

## Professional Members

- IEEE (Institute of Electrical and Electronics Engineering) Members (Feb 2024 to Present )
- IEEE Young Professionals (Feb 2024 to Present)

## Language Competency

- English: Fluent language
- Italian: Beginner (Intermediate)
- Dutch: Beginner
- Amharic: Native language

## Professional References

- **Dr.Teo Tee Hui**: Engineering Product Development, Science, Mathematics and Technology, Singapore University of Technology and Design, Singapore. [Thesis Advisor] Phone:+656564994604,
  Email: tthui@sutd.edu.sg
- **Professor Tan Cher Ming:** Chair professor, director, CReST center, Chang Gung University, Tiawan. [Instructor] Phone number: (+886) 88632118800,
  Email: cmtan@cgu.edu.tw
- **Professor Bing J. Sheu:** Chair Professor, Department of Electronics Engineering, Chang Gung University, Tiawan. [Instructor] Phone number: (+886) 88632118800,
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## Privacy Statement

- Autorizzo il trattamento dei miei dati personali ai sensi del D. Lgs. 196/2003 e del GDPR (Regolamento UE 2016/679) ai fini della ricerca e selezione del personale.