BISSMELLA BAHADURI

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EDUCATION

Master-2 in Mathematics, Vision, Apprentissage ENS Paris-Saclay **Sept. 2024 – Sept. 2025**
Coursework: Convex optimization, Geometric deep learning, Reinforcement learning, Robotics, 3D computer vision, statistical learning and computation, …

Master in Innovative Information Systems University of Toulouse Capitole **Sept. 2021 – Sept. 2023**
Coursework: Data Analytics; Artificial Intelligence; Advanced Programming; Advanced Artificial Intelligence; Advanced Data Management.
Competences acquired: Deep learning, Computer Vision, NLP, Reinforcement learning, Graph theory, Graph search, Web development.
Grades average: 14.6/20

Bachelor's in Management Information Systems Kabul University **Apr. 2014 – Oct. 2017**
Coursework: Programming Languages; Statistics & probabilities; Linear Algebra; Math analysis; Databases.
Grades average: 85.3/100

PUBLICATIONS

[1] Bahaduri, B., Ming, Z., Feng, F., & Mokraou, A. (2023). Multimodal Transformer Using Cross-Channel attention for Object Detection in Remote Sensing Images. In ICIP (**oral**), 2024.

[2] "1 main-author paper under review at ICLR - 2025 main conference."

INVITED PRESENTATIONS

Indirect-attention: IA-DETR for one-shot object detection
Host: Anissa Mokraoui, Fangchen Feng; June 2024; Paris, France

RESEARCH/PROFESSIONAL EXPERIENCE

Research and Development Engineer L2TI - University of Sorbonne Paris Nord **Nov. 2023 – Aug. 2024**
- Reviewed SOTA methods and papers for few-shot object detection.
- Benchmarked the SOTA methods on aerial images dataset.
- Improved SOTA method on one-shot object detection.
- Assisted with research interns.

Computer Vision Intern L2TI - University of Sorbonne Paris Nord **Apr. 2023 – Sept. 2023**
- Reviewed SOTA methods and papers for object detection in aerial imagery.
- Studied transferability of a large vision model's (Segment Anything Model) knowledge for object detection in remote sensing imageries.
- Proposed a VIT based model with channel fusion module for object detection in multi-modal satellite imagery.
- Documented findings, experiment observations in technical report and **research paper**.

Information Management, consultant UN Environment Programme **Oct. 2021 - Dec. 2021**
- Prepared and implemented data pipelines for mapping artisanal gold mining risks for the environment. Technologies used: **Python, QGIS**
- Analyzed and modeled suitable areas for urban expansion considering factors such as protected areas, environmental risk and hazards, and distance to existing urban areas. Technologies used: Python, QGIS

Information Management Specialist　　　　**UN Environment Programme**　　　　**Aug. 2019 - June 2021**

- Developed and implemented machine learning models for mapping forest cover change, mapping forest fires, and rangeland cover change in Afghanistan for different time periods using satellite imageries.
- Worked with large datasets and created data pipelines for environmental modeling of reforestation.
- Technologies used: **Python, machine learning, computer vision**, JavaScript.

TECHNICAL PROJECTS

Projects
- **Llama 2 LLM finetuning** (Oct. 2024). Finetuning Llama 2 (LLM) model on personal chat data for personal use.
- **Blind Navigation** (Feb. 2023). Trained a smart agent for point goal navigation task with no visuals from environment using Reinforcement learning. Used PPO, LSTM, PyTorch.
- **Chat-bot** (Dec. 2022). **Fine-tuned a dense passage retrieval, and a question answering model for a chatbot to answer questions about marriage based on France's marriage law using pretrained models on French data. Used Python, NLP, transformers, Gradio**.
- **Two-factor Authentication** (Oct. 2022). Developed and implemented two-factor authentication with Raspberry pi with RFID card and face recognition using Python, and OpenCV
- **France Highway Traffic Data (Bison-fute) Analysis** (Jul. 2022). Processed, cleaned, analyzed, and visualized a huge dataset of France highway traffic data scrapped from bison-fute website using python.
- **Image preprocessing (2021)** Assisted with a PHD candidate at IRIT in detecting forest cover change using deep learning.

ADDITIONAL EXPERIENCE AND AWARDS

- **First team award - X-Lab Innovation lab Competition Winner with Luiss University - Italy (May 2022):** Collaborated in a team for designing and developing of a sustainable business idea to address river pollution that was selected as the best start-up idea among participating teams.
  Represented UT1-Capitole as part of a university partnership program (ENGAGE).
- **Programming Tutor (Sept. 2022):** Taught a one week of introductory programming course to M1 students.

COMPETENCIES AND SKILLS

- Deep learning, Reinforcement learning, Computer vision, NLP, PyTorch, Keras, skLearn, Applied math, distributed computation
- Python, Java, Javascript, C, Git
- Project management (PRINCE2 foundation certified)

LANGUAGES

English: C1
French: B2
Persian: Native