Koffivi Fidèle Gbagbe

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Publications

IEEE ICRA 2025

– A. Lykov, M. Konenkov, **K. Fidele Gbagbe**, M. Litvinov, D. Davletshin, A. Fedoseev, M. Altamirano Cabrera, R. Peter, D. Tsetserukou, **"CognitiveOS: Large Multimodal Model based System to Endow Any Type of Robot with Generative AI,"** in Proc. IEEE Int. Conf. on Robotics and Automation (ICRA 2025), Atlanta, USA, May 19-23, 2025, in print. (Core2023 A*, No. 1 Conference in Robotics, Scopus and WoS, H-index (SJR)=222)

IEEE/RSJ IROS 2025

– A. Lykov, M. Altamirano Cabrera, M. Konenkov, V. Serpiva, **K. Fidele Gbagbe**, A. Alabbas, A. Fedoseev, L. Moreno, M. H. Khan, Z. Guo, and Dzmitry Tsetserukou, **"Industry 6.0: New Generation of Industry driven by Generative AI and Swarm of Heterogeneous Robots,"** in Proc. IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS 2025), Hangzhou, China, 19-25 October, 2025, accepted. (No. 1 Conference in Intelligent Robotics and No. 2 in Robotics, Core2023 A, Scopus and WoS, H(SJR)=150)

IEEE SMC 2024

– **K. Fidele Gbagbe**, M. Altamirano Cabrera, A. Alabbas, O. Alyounes, A. Lykov, D. Tsetserukou, " **Bi-VLA: Vision-Language-Action Model-Based System for Bimanual Robotic Dexterous Manipulations**," in Proc. IEEE Int. Conf. Systems, Man, and Cybernetics (SMC 2024), Sarawak, Malaysia, 6-10 Oct., 2024, pp. 2864-2869.

IEEE FLLM 2024

– A. Lykov, M. Altamirano Cabrera, **K. Fidele Gbagbe**, D. Tsetserukou, **"Robots Can Feel: LLM-based Framework for Robot Ethical Reasoning,"** in Proc. IEEE Int. Conf. Foundation and Large Language Models (FLLM 2024), Dubai, UAE, 26-29 Nov., 2024. s

Education

Skolkovo Institute of Science and Technology (Skoltech) *Moscow, Russia, Oct.2022 - Jun.2024*
***Degree**: Master of Science in Computer Science,*
***Thesis**: Robotic Skill Synthesis for Bimanual Dexterous Manipulation based on Vision-Language-Action Model*
***Supervisors**: Prof. Dzmitry Tsetserukou, Dr. Miguel Altamirano Cabrera (ISR-Lab, Skoltech - Russia)*

African Institute for Mathematical Sciences (AIMS) *Kigali, Rwanda, Aug.2021 - Jun.2022*
***Degree**: Master of Science in Mathematical Sciences,*
***Thesis**: Approximation of Nonlinear Inverse Operators using ANN with an Application to the Inverse Gravimetry Problem*
***Supervisors**: Prof. Jodi Mead (Department of Mathematics, Boise State University - USA)*

University of Lomé *Lomé, Togo, Oct 2015 - Jun 2019*
***Degree**: Bachelor of Science in Mathematics,*
***Thesis**: N/A*
***Supervisors**:N/A*

Skills

Programming Languages:
Python/PyTorch, C/C++, Go, JavaScript

Robotic Simulation:
ROS2, PyBullet, Gazebo

Web Development Stack:
Go, React, MongoDB

Languages:
English (fluent), French (native), Russian (intermediate)

Experience

CortexTor Labs
AI Research Intern *May 2025 - Present*

– Conduct cutting-edge research in multimodal AI for education, focusing on visual storytelling and causal reasoning across text, images, and audio
– Contribute to academic publications and open-source tools supporting AI applications in education.
References: Dr. Dushyant Singh Chauhan

Nanosemantics
Robotics Research Intern *July 2024 - Jan 2025*

- Develop a joint localization algorithm for a swarm of drones using ROS2 and PyBullet
- Enable decentralized coordination and accurate position estimation in simulated multi-agent environments.
  References: Dr. Aleksey Fedoseev

AI Medtech
Machine Learning Intern *May 2023 - October 2023*

- Develop transformer-based machine learning methods for processing multimodal data in telemedicine and remote robotic care
- Focus on improving predictive accuracy, interpretability, and context-aware decision-making to support clinicians remotely.
  References: Dr. Oleg Rogov

ANVT (National Volunteer Agency of Togo)
Mathematics Teacher *Sep 2020 – Aug 2021*

- Taught mathematics at Hedzranawoé High School in Lomé as part of a national community service program.
- Supported secondary-level education and contributed to local educational development efforts.

Projects

- **Creator & Author, LLMatics (LLM+Mathematics):** Link
  Founded and authored a technical blog focused on the mathematical foundations and theoretical principles of large language models. Deliver clear, in-depth explanations of complex mathematical concepts behind language models, alongside practical tutorials and code implementations using PyTorch to bridge theory and application.

- **Convexity Regularizer for Neural Optimal Transport:** Link
  We incorporated a convexity regularizer in the neural optimal transport algorithm to enhance the quality of the inverse mapping for strong transport costs and evaluated its performance on unpaired image-to-image translation using colored MNIST digits dataset.

- **Pytorch Magnet Loss Implementation:** Link
  PyTorch implementation of the Magnet Loss, as proposed in the ”Metric Learning with Adaptive Density Discrimination” paper, applied to the CIFAR-10 dataset.

Online Courses with certificates

- Modern Computer Vision, *Udemy, by Rajeev D. Ratan*
- Natural Language Processing with Python, *Udemy, by Jose Portilla*
- The Complete Web Development Bootcamp, *Udemy, by Dr. Angela Yu*
- Data Structures and Algorithms using C++, C and Python, *Udemy, by Atchyut Kumar*

References

- **Prof. Dzmitry Tsetserukou**
  Head of the Intelligent Space Robotics Laboratory / Center for Digital Engineering at Skoltech, Moscow, Russia
  E-mail: d.tsetserukou@skoltech.ru
  Scholar Profiles: Personal Page — Google Scholar

- **Prof. Claude Tadonki**
  Senior Researcher - HPC, CRI - Fontainebleau, MINES ParisTech - PSL Research University, Paris, France
  E-mail: claude.tadonki@minesparis.psl.eu
  Scholar Profiles: Personal Page — Google Scholar

- **Prof. Bernd Schroers**
  Head of the School of Mathematics at the University of Edinburgh, Edinburgh, Scotland, The United Kingdom
  E-mail: B.J.Schroers@hw.ac.uk
  Scholar Profiles: Personal Page — Google Scholar