Mirgahney H. Mohamed

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Summary

I am a UCL PhD candidate in 3D computer vision, focusing on motion, deformation, and generative modelling. My work utilizes advanced deep learning and graphics techniques, including NeRF, 3D Gaussian Splatting, and Diffusion models, to model the 4D world under Prof. Lourdes Agapito's supervision. I also have entrepreneurial experience as co-founder and CEO of Intelligent Analytics, managing AI-driven solutions from planning to client partnerships. This blend of research and business experience helps me develop AI solutions for real challenges.

Experience

Google DeepMind May. 2024 – Dec. 2024
Student Researcher *London, UK*

- Led a monocular 4D reconstruction project using 3D Gaussian Splatting, achieving SOTA depth estimation and comparable RGB reconstruction and tracking. Trained on (16-32)x A100 and (8-16)x H100 GPUs.
- Extended internal open-source system incorporating 3D visualization methods.

Meta Feb. 2020 – Feb. 2021
AI Resident, Foundational AI Research (FAIR) *Menlo Park, CA US*

- Led a navigation project for multi-legged robots utilizing inverse reinforcement learning and vision-based dynamics deep learning models.

Qualcomm AI Research Jul. 2019 – Feb. 2020
Engineering Intern *Amsterdam, The Netherlands*

- Developed and led an open-source project to help diagnose diseases using AI, leading to a demo.
- Conducted research applying deep learning in the medical field on portable devices, leading to a published paper.
- Invented a new loss that preserves neural network equivariance under extreme transformations, which was subsequently patented (US Patent App. 17/170,745).

Intelligent Analytics Mar. 2017 – Mar. 2020
Co-founder & CEO *Khartoum, KH Sudan*

- Led the development of text-based analytics solutions and dashboards for customer textual feedback and comments. This project reduced manual work by 43%, and enabled clients to make quick data-driven decisions.
- Managed strategy, product development, and client partnerships, including onboarding Zain, a major multinational telecommunications company, as an ongoing client; successfully shipped and delivered a product to Zain.
- Currently supporting the development of the next solution with cutting-edge LLMs and RAG technologies.

Sudatel Sept. 2017 – Jun. 2018
Marketing Intelligence Specialist, Sudani *Khartoum, KH Sudan*

- Developed predictive machine learning models that analyse complex data and produce actionable insights to enhance customer understanding and user-centric product development.
- Conducted social network analysis (SNA) on calling data to identify communities of customers who interact frequently or share characteristics, and examine how these communities relate to ARPU levels and churn rates.
- Identify market trends to inform strategic marketing decisions and support data-driven strategies by providing comprehensive analytical insights.

University College London Sept. 2020 – Present
Teaching Assistant *London, UK*

- Delivered courses including Image Processing, Machine Vision, Introduction to Machine Learning, ML for Domain Adaptation, and ML Seminars.

Education

University College London (UCL) London, UK
PhD student, my research focuses on 3D vision, motion, deformation, and generative modeling. *Sept. 2020 – present*

African Institute for Mathematical Sciences (AIMS) Kigali, Rwanda
Master of Intelligence Science, African Master of Machine Intelligence (AMMI), Distinction. *Sept. 2018 – Sept 2019*

University of Khartoum Khartoum, Sudan
Bachelor (Hons.) of Statistics and Computer Science, GPA 7.2/10 *Sept. 2011 – Dec 2016*

Publications & Patents

Mohamed, Mirgahney and Lourdes Agapito (2024). "DynamicSurf: Dynamic neural RGB-D surface reconstruction with an optimizable feature grid". In: *2024 International Conference on 3D Vision (3DV)*. IEEE.

— (2022). "GNPM: Geometric-aware Neural Parametric Models". In: *2022 International Conference on 3D Vision (3DV)*. IEEE.

MOHAMED, Mirgahney Husham Awadelkareem et al. (Aug. 2021). *Data and compute efficient equivariant convolutional networks*. US Patent App. 17/170,745.

Mohamed, Mirgahney, Gabriele Cesa, et al. (2020). "A data and compute efficient design for limited-resources deep learning". In: *AI4 Developing Countries, ICLR*.

Fu, Jie et al. (2019). "Detecting Waterborne Debris with Sim2Real and Randomization". In: *AI for Social Good, ICML*.

Service

Reviewer Since 2014 – present

- Regular reviewer at CVPR, ICLR, ICML and NeurIPS.
- Occasional reviewer for ICCV, ECCV, 3DV and AAAI.

Achievements & Awards

Best National Graduation Project in Computer Science award. Aug. 2017
Khartoum, Sudan

- National competition for the best graduation research in the field of computer science.

Faculty Award for Second Academic Achievement. Dec. 2016
Khartoum, Sudan

First team prize at the Sudan Universities Programming Contest. 2015
Khartoum, Sudan

- Award given to the top programming team among all Sudanese universities.

Professor Eltaher El-ageb Award for Applied Mathematics. Sept. 2012
Khartoum, Sudan

- Award given to the student who achieves the highest grades in applied mathematics during their first year.

Faculty Award for Best Academic Achievement. Sept. 2012
Khartoum, Sudan

Skills

Programing Languages: Python, Java, C++, SQL, R.

Machine Learning: PyTorch, Jax, TensorFlow, CUDA, Scikit-learn.