

Amna Elmustafa

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Education

Arizona State University PhD in Computer Science • Supervisors: Hannah Kerner • Working on Generalization/Robustness of remote sensing models	AZ, USA Aug 2024 - May 2029
Stanford University King Center on Global Development Predoctoral Research Fellowship • Supervisors: Stefano Ermon, David Lobell, Irene Lo, David Rolnick • Working on research projects at the intersection of Machine Learning and Global Development	CA, USA Sept 2022 - June 2024
AIMS Senegal M.Sc in Mathematical Sciences • Sponsored by Google and FAIR • Graduated with Distinction in Research • Relevant Modules: Foundations of ML/DL, Computer Vision, NLP, Optimization, Geometric DL, RL	Mbour, Senegal 2021 -2022
Khartoum University B.Sc Electrical and Electronics Engineering • Graduated with Distinction • Relevant Modules: Linear Algebra, Statistics and Probability, Data Structures	Khartoum, Sudan Sept 2013 - Sept 2018

Publications and Preprints

HarvestNet: A Dataset for Detecting Smallholder Farming Activity Using Harvest Piles and Remote Sensing Jonathan Xu*, Amna Elmustafa *, Liya Weldegebriel, Emnet Negash, Richard Lee, Chenlin Meng, Stefano Ermon, David Lobell <i>Proceedings of the AAAI Conference on Artificial Intelligence (AAAI-24)</i> , 2024	
SatBird: A dataset for bird species distribution modeling using remote sensing and citizen science data Mélisande Teng, Amna Elmustafa , Benjamin Akera, Yoshua Bengio, Hager Radi, Hugo Larochelle, David Rolnick <i>Advances in Neural Information Processing Systems (NeurIPS)</i> , 2023 <i>Best Paper Award at ICLR workshop on Tackling Climate Change with Machine Learning</i> , 2023	
Understanding economic development in rural Africa using satellite imagery, building footprints and deep models Amna Elmustafa , Erik Rozi, Yutong He, Gengchen Mai, Stefano Ermon, Marshall Burke, David Lobell <i>Proceedings of the 30th International Conference on Advances in Geographic Information Systems (SIGSPATIAL)</i> , 2022	
A comparative study on human loco-motor activity recognition using wearable sensors Amna Abdallah , Rawan S Abdulsadig, Magdi Amien <i>2019 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCEEE)</i> , 2019	

Achievements

2024	Fulton Fellowship , awarded by the Ira A. Fulton Schools of Engineering at Arizona State University	USA
2023	Best paper , at ICLR workshop Tackling Climate Change with Machine Learning	Rwanda
2022	Two-year Predoctoral Research Fellowship , Stanford King Center on Global Development (1.7% acceptance rate)	USA
2022	Acceptance , Google AI Residency	Ghana
2021	Scholarship , DAAD (The German Academic Exchange Service)	Germany
2021	Scholarship , AMMI Master Scholarship (6% acceptance rate), sponsored by Facebook and Google	Senegal
2018	Top 5% , Best Performing students in the undergraduate program	Khartoum

Work/Teaching Experience

Stanford AI Sustainability Lab Predoc Fellow • Supervisors: Stefano Ermon, David Lobell	USA 2022 - 2023
Mila-Quebec AI Institute Research Intern • Supervisors: David Rolnick	Remote 2022 - 2024

AMMI-African Master of Machine Intelligence

Teacher Assistant

- Courses: Foundation of ML, DL, CV, NLP

Senegal

Jan 2022 - July 2022

EPFL-ML and Optimization Lab

Research Intern

- Supervisors: Annie Mary Hartly

Remote

July 2022 - Sept 2022

Omdena

Junior ML Engineer

- Used NLP tools to predict business opportunities from meeting minutes and agendas before an RFP is posted

Remote

June 2021 - August 2021

Techno-Tec for IT solutions and services

Software Engineer

- Leader of back-end systems for web services team

Sudan

June 2020 - December 2020

MT for Industrial Supplies and Services

Application Engineer

- Designed/implemented automation systems for oil/gas industry

Sudan

May 2019 - June 2020

Khartoum University

Teaching Assistant

- Co-Instructor of Java language Lab

Sudan

Nov 2019 - March 2020

Selected Projects

Masked Diffusion Models are Versatile Visual Learners

Predoc research project

- Developed a general framework for discriminative(self supervised models) and generative models(diffusion models) using MAE as a backbone for both models

CA, USA

Oct 2022 - Mar 2023

PhantoMedicus: A data simulator to benchmark Clinical Decision Support Networks

EPFL Internship

- Used Bayesian networks and Decision Trees to simulate and generate patient-level consultation data

Remote

Jul 2022 - Sept 2022

Hyper Parameters Optimization with RL

Master Coursework

- Built an Environment for learning best NN hyperparameters for regression/classification tasks using policy gradient

Senegal

Sept 2021

Cassava images dataset classification

Master Coursework

- Achieved 91% in classifying cassava plants as belonging to one of 4 various disease classes or healthy using Resnet50 architecture.

Senegal

Apr 2021

Tabular data prediction using SAINT model architecture

Paper re-implementation

- SAINT model performs attention over both rows and columns. It also uses contrastive self-supervised pre-training.
- Implemented the model architecture and conducted experiments on different datasets.

Senegal

Aug 2021

Skills

Programming	Python (Pandas, PyTorch, NumPy, Scikit-learn. etc.), C/C++, HTML/CSS, JavaScript, Matlab
Miscellaneous	Linux, Shell (Bash/Zsh), \LaTeX (Overleaf/R Markdown), Microsoft Office, Git.
Soft Skills	Technical Writing, Teamwork, Critical Thinking, Documentation, Engaging Presentation.
Languages	English: Professional proficiency, Arabic: Native proficiency

Activities

NeurIPS 2023 CompSust Workshop	peer reviewer for computational sustainability workshop
WIMLDS	Women in machine learning and data science, Sudan chapter Volunteer
IEEE Sudan	Institute of Electrical and Electronics Engineering, Sudan chapter Volunteer
ArabWIC	Arab women in computing, Sudan chapter social media coordinator