

Amna Elmustafa

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Education

Stanford University

Predoc Research Fellowship

CA, USA

Sept 2022 - Current

- **Supervisors:** Stefano Ermon, David Lobell, Irene Lo, David Rolnick
- working on research projects at the intersection of Machine Learning and Global Development

AIMS Senegal, Facebook, and Google

M.Sc in Mathematical Sciences

Mbour, Senegal

2021 -2022

- Graduated with Distinction in Research
- **Relevant Modules:** Foundations of ML/DL, Computer Vision, NLP, Optimization, Geometric DL, RL.

Khartoum University

B.Sc Electrical and Electronics Engineering

Khartoum, Sudan

Sept 2013 - Sept 2018

- Graduated with Distinction
- **Relevant Modules:** Linear Algebra, Statistics and Probability, Data Structures.

Publications and PrePrints

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

Conference on Neural Information Processing Systems (NeurIPS), 2023

Bird Distribution Modelling using Remote Sensing and Citizen Science data

Mélisande Teng, **Amna Elmustafa**, Benjamin Akera, Hugo Larochelle, David Rolnick

*arXiv preprint arXiv:2305.01079, **Best Paper Award** at ICLR workshop on Tackling Climate Change with Machine Learning (2023). 2023*

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

arXiv preprint arXiv:2308.12061 (2023). 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

Proceedings of the 30th International Conference on Advances in Geographic Information Systems, 2022

A comparative study on human loco-motor activity recognition using wearable sensors

Amna Abdallah, Rawan S Abdulsadig, Magdi Amien

2019 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCEEE), 2019

Work/Teaching Experience

Mila-Quebec AI Institute

Research Intern

Remote

2022 - Current

- Supervisors: David Rolnick

AMMI-African Master of Machine Intelligence

Teacher Assistant

Senegal

Jan 2022 - July 2022

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

EPFL-ML and Optimization Lab

Research Intern

Remote

July 2022 - Sept 2022

- Supervisors: Annie Mary Hartly

Omdena

Junior ML Engineer

Remote

June 2021 - August 2021

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

Techno-Tec for IT solutions and services

Software Engineer

Sudan

June 2020 - December 2020

- Leader of back-end systems for web services team

MT for Industrial Supplies and Services

Application Engineer

Sudan

May 2019 - June 2020

- Designed/implemented automation systems for oil/gas industry

Selected Projects

Mapping Smallholder Farming Activity Using Harvest Piles and Remote Sensing in Ethiopia

CA, USA

Predoc research project

Sept 2022 - Aug 2023

- Used satellite images to detect harvest piles as a more accurate estimate for croplands in Ethiopia

Masked Diffusion Models are Versatile Visual Learners

CA, USA

Predoc research project

Oct 2022 - Mar 2023

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

Bird Distribution Modelling using Remote Sensing and Citizen Science data

Remote

MILA Internship

Mar 2022 - Current

- Mapped US bird species to their habitats by predicting species encounter rates from satellite images.

PhantoMedicus: A data simulator to benchmark Clinical Decision Support Networks

Remote

EPFL Internship

Jul 2022 - Sept 2022

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

Hyper Parameters Optimization with RL

Senegal

Master Coursework

Sept 2021

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

Cassava images dataset classification

Senegal

Master Coursework

Apr 2021

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

Tabular data prediction using SAINT model architecture

Senegal

Paper re-implementation

Aug 2021

- 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.

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

Achievements

2023	Best paper , at ICLR workshop Tackling Climate Change with Machine Learning.	Rwanda
2022	Scholarship , One out of two current Sudanese grad students came straight from Sudan to Stanford with a full scholarship.	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

Activities

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