

# Abdallah Bashir

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**Authorization:** U.S. Permanent Resident (Green Card holder)

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## EDUCATION

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### Saarland University

*Master of Science in Computer Science*

*Saarbrücken, DE*

### University Of Khartoum

*Bachelor of Science in Electrical And Electronics Engineering, Minor in Software Engineering*

*Khartoum, SD*

## EXPERIENCE

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### Applied Scientist II

Aug 2022 – Now

*Goldman Sachs, NLP Modeling Team*

*London, UK*

- Spearheaded the development and integration of advanced machine learning and deep learning models, with a focus on Natural Language Processing (NLP) and Large Language Models (LLMs). Trained and fine-tuned different classes of models for NLP usecases.
- Innovated in areas such as retrieval and reranking, retrieval augmented generation (RAG), fine-tuning LLMs, text classification, named entity recognition, semantic parsing, and synthesizing training data to be used in various model training exercises. Significantly advancing the capabilities of LLMs in interpreting and processing human language for enhanced customer experiences.
- Proficiently utilize Python, PyTorch, and distributed computing frameworks for efficient model training on GPU clusters. Design and maintain deployment pipelines with continuous integration, version control, and monitoring.
- Comfortable diving into ambiguous problems by conducting extensive literature reviews to understand the state of the art at the time. Drive and implement solutions that address complex challenges, transforming research findings into production-ready code.
- Achievements - Co-developed two patent-pending frameworks and implemented ML solutions that realized a cost reduction of 10M USD, demonstrating a direct impact on operational efficiency and innovation.

### Applied Scientist Intern

Apr 2022 – Jul 2022

*Amazon*

*Seattle, USA*

- Using Transformers-based models, Implemented an end-to-end unsupervised framework to identify sensitive trending topics in Alexa traffic.
- Achievements - the framework will increase the robustness of online sensitive detection models in Alexa by refining the quality of labeling data.

### Research Intern

Jan 2022 – Mar 2022

*Allen Institute for Artificial Intelligence*

*Seattle, USA*

- Conduct research in Natural Language Proceeding Data Augmentation using Language models using LSTMs and Transformers
- Implemented pipelines that leverage models like Albert and BART to extrapolate datasets with structured entities.

### Machine Learning Intern

Apr 2021 – Aug 2021

*Goldman Sachs*

*Frankfurt, DE*

- Curate, parse, preprocess data related to git projects in the organization.
- Implementing Deep learning models with Attention to identify high-risk changes in Git Software products.
- Achievements - Implemented a Machine Learning based tool to help code reviewers detect high-risk changes in software products

### Research Assistant

Nov 2019 – Mar 2021

*Max Planck Institute For Informatics*

*Saarbrücken, DE*

- Conducted groundbreaking research focused on integrating contextual understanding into neural language models through contrastive learning approaches.
- Implemented models in diverse applications including healthcare, achieving significant reductions in model size and computation time while maintaining competitive accuracies.

- Developed novel model architectures utilizing Knowledge Graphs to enhance model performance in NER and QA tasks across specialized domains.

## Software Engineer, Co-Founder

Sep 2015 – Oct 2016

*EchoNine IT Solutions Startup*

*Khartoum, SD*

- Gathered and defined customer requirements to develop clear specifications for creating well-organized project plans.
- Designed, built, and monitored web and mobile applications for continuous improvement
- Achievements - building a product in cooperation with Zain Sudan, the top telecommunication company in the country.

## PROJECTS

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### LLaMA2 from Scratch | *Machine Learning, Python, Pytorch, Transformers, LLM, Git* Mar 2024 – Mar 2024

- \* The project aims to build the LLaMA 2 architecture from scratch, incorporating essential advancements in transformer models. Key enhancements include RMS-Normalization, SwiGLU activation, Rotary Positional Embeddings, and advanced attention mechanisms like Grouped-Query Attention. The model was trained using DeepSpeed on 8xh100 GPUs.

### Music Synthesizer | *Python, Pytorch, Language Models, Streamlit, Git* Jan 2020 – May 2020

- \* Using Deep Learning, we try to generate pop and classic music by converting music notes to text and training neural language models
- \* Implemented transformer-based Deep Learning models to be trained on the music notes text. Evaluated the generated music by getting insights from experts and using music theory tests.
- \* Helped in implementing a demo for the project using Streamlit

## PUBLICATIONS

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### Venues | *Findings of EMNLP 2020* Sep 2020

- \* W. Nekoto et al., “Participatory Research for Low-resourced Machine Translation: A Case Study in African Languages,” arXiv:2010.02353 [cs], Oct. 2020, Accessed: Oct. 15, 2020. [Online]. Available: <http://arxiv.org/abs/2010.02353>.

### Venues | *ICLR'20 AfricaNLP workshop* Mar 2020

- \* I. Orife et al., “Masakhane – Machine Translation For Africa,” arXiv:2003.11529 [cs], Mar. 2020, Accessed: Mar. 29, 2020. [Online]. Available: <http://arxiv.org/abs/2003.11529>.

### Venues | *ACLing'18, NeurIPS'18 Black in AI workshop* Nov 2018

- \* A. M. Bashir, A. Hassan, B. Rosman, D. Duma, and M. Ahmed. Implementation of A Neural Natural Language Understanding Component for Arabic Dialogue Systems. *Procedia Computer Science*, 142:222–229, Jan. 2018

## AWARDS AND ACCOMPLISHMENTS

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- **Wikimedia** *Co-winner of the Research Award of the Year | Apr 2021*
- **ACLing** *Awarded Outstanding Paper Award | Nov 2018*
- **University of Khartoum** *Awarded Scientific Innovation Award for BSc Thesis. | Oct 2018*
- **Deep Learning Indaba** *Awarded Poster Award. | Sep 2018*
- **IndabaX Sudan** *Co-organized and led the team of IndabaX Sudan. | Apr 2018*
- **TEDx** *Organized and led the team of TEDxYouth@NileStreet which was reported by the press to be the most engaging event of the year. | Oct 2016*

## SKILLS

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Machine Learning, Deep Learning, Natural Language Processing, Dialogue Systems, Machine Translation, Natural Language Understanding, Computer Vision, Statistics, Annotation, Benchmarking, Debugging, Prototyping, Technical Reports, Research, Python, R, Swift, C/C++, SQL, Assembly, HTML/CSS, Java, PyTorch, TensorFlow and Keras, Deepspeed, CUDA, Scikit-learn, Hugging Face, Langchain, Fast.ai, Django, Docker, Linux, Git, Flask, Streamlit, Metaflow, AWS Sagemaker, Pandas, NumPy, Matplotlib, Parallel / Distributed computing, Accelerators in GPUs, Data Analysis and Visualization, Data Mining