

# Yusuf Brima

## Contact

📍 Hans-Böckler-Straße 16, D-49074, Osnabrück, Germany  
✉ ybrima@uos.de  
☎ +49 176 59713206  
🌐 <https://yusufbrima.github.io>

## SUMMARY

AI/ML researcher (Cognitive Science Ph.D. expected May 2025) with 7+ years of experience leading research projects in machine learning and deep learning. Developed novel algorithms with improved performance published in top venues such as ICLR, NeurIPS, Springer Nature, etc. Specializing in computer vision, audio processing, and representation learning. Seeking to apply AI/ML expertise to advance disease prevention, early diagnosis, and therapeutic interventions in healthcare.

## SKILLS

**Programming Languages:** Python, C/C++, R, JavaScript, HTML/CSS  
**Machine Learning & Data Science:** TensorFlow, Keras, PyTorch, SciKit-Learn, CUDA, NumPy, Pandas, Matplotlib, Seaborn, Plotly, Dash  
**Image Processing:** OpenCV, Scikit-Image  
**Audio Processing:** Librosa, SoundFile, Wave, pydub  
**High-Performance & Grid Computing:** SLURM, Oracle Sun Grid Engine  
**Databases:** MySQL, PostgreSQL, Oracle, SQL Server  
**Software:** Git/GitHub, L<sup>A</sup>T<sub>E</sub>X, Bash, Google Workspace, Microsoft Suite, Jira  
**Operating Systems:** Linux, Unix, Windows  
**Languages:** English (bilingual), French (A1), German (A1)

## EDUCATION

- **Osnabrück University, Osnabrück, Germany**
  - Ph.D. Cognitive Science, Expected May 2025
  - Award: Research Training Group (RTG) in Computational Cognition DFG Research Grant
- **African Institute of Mathematical Sciences (AIMS), Kigali, Rwanda**
  - MSc. Mathematical Sciences, Jul 2021
  - Award: AIMS & MasterCard Foundation Scholarship
- **University of Dhaka, Dhaka, Bangladesh**
  - MSc. Computer Science & Engineering, Aug 2020
  - Award: Queen Elizabeth Commonwealth Fellowship
- **University of Makeni, Makeni, Sierra Leone**
  - BSc. Computer Science, Feb 2017
  - Award: Undergraduate Merit Scholarship

## EXPERIENCE

- **Osnabrück University, Germany**
  - Research Associate, Nov 2021 – Present

- Conduct extensive research in Cognitive Science and Deep Learning, focusing on computer vision, audio processing, and representation learning; developed novel algorithms improving data processing efficiency by 20% and enhancing model accuracy by 25%
- Curated SynSpeech, a novel dataset for disentangled audio representations, and trained generative models; published a demo page to showcase results and resources: <https://synspeech.github.io/>.
- Published papers in top conferences and journals including NeurIPS, ICLR, Springer Nature
- Developed and maintained open-source code implementations for all published research, available on GitHub
- Mentored 5+ students and presented research at international conferences
- **University of Makeni, Sierra Leone**
  - Research Teaching Assistant, Feb 2017 – Jul 2018
  - Taught Computer Science courses to 40+ students per class, designed lectures and exams
  - Supervised 4+ student dissertations and bachelor projects, resulting in a 90% successful completion rate
- **Limkokwing University of Creative Technology, Sierra Leone**
  - Lecturer, Jan 2018 – Jul 2018
  - Taught Principles of Programming Logic and Design to 120+ students per semester

## ADDITIONAL CERTIFICATIONS

- **IBM AI Engineering Professional Certificate** (08/2023 - 09/2023, Virtual) Certificate Link
  - Core skills: Neural networks, deep learning, TensorFlow, Keras, hyperparameter tuning.
- **IBM Data Science Professional Certificate** (02/2023 - 08/2023, Virtual) Certificate Link
  - Core skills: Python programming, data visualization, machine learning, SQL, cloud computing.
- **University of Michigan** (03/2023 - 04/2023, Virtual) Certificate Link
  - Core skills: Python data structures, algorithms, recursion, object-oriented programming.
- **MathWorks Training Service, MOOC** (08/2020 - 09/2020) Certificate Link
  - Core skills: MATLAB, deep learning for image recognition, transfer learning, pre-trained networks.
- **Imperial College London, Virtual** (08/2019 - 06/2020) Certificate Link
  - Core skills: Linear algebra, multivariate calculus, principal component analysis, optimization techniques.

## SELECTED PUBLICATIONS

- Brima, Y., Atemkeng, M. Saliency-driven explainable deep learning in medical imaging: bridging visual explainability and statistical quantitative analysis. *BioData Mining* 17, 18 (2024). <https://doi.org/10.1186/s13040-024-00370-4>
- Nhlapho, W.; Atemkeng, M.; Brima, Y. et al. (2024). Bridging the Gap: Exploring Interpretability in Deep Learning Models for Brain Tumor Detection and Diagnosis from MRI Images. *Information*, 15(4), 182. doi:10.3390/info15040182.
- Brima, Y. et al. (2024). Understanding Self-Supervised Learning of Speech Representation via Invariance and Redundancy Reduction. *MDPI Information*, 15(2), 114. doi:10.3390/info15020114.
- Hamlomo, S.; Atemkeng, M.; Brima, Y.; Nunhokee, C.; Baxter, J. (2024). Advancing Low-Rank and Local Low-Rank Matrix Approximation in Medical Imaging: A Systematic Literature Review and Future Directions. *arXiv preprint arXiv:2402.14045*. (Accepted at *Springer Neural Computing and Applications (NCAA)*)
- Brima, Y. et al. (2023). Learning Disentangled Speech Representations. *New in Machine Learning Workshop, NeurIPS 2023*, New Orleans, USA.
- Brima, Y. et al. (2023). Learning Disentangled Audio Representations through Controlled Synthesis. Presentation at ICLR Tiny Papers Track 2024. arXiv:2402.10547.
- Brima, Y. et al. (2021). Transfer learning for the detection and diagnosis of types of pneumonia including pneumonia induced by COVID-19 from chest X-ray images. *Diagnostics*, 11(8), 1480. doi:10.3390/diagnostics11081480.
- Brima, Y. ., Kamal Tushar, M. H., Kabir, U. ., & Islam, T. (2022). Deep Transfer Learning for Brain Magnetic Resonance Image Multi-class Classification. *Dhaka University Journal of Applied*

## CONFERENCES & WORKSHOPS

- International Conference on Learning Representations (ICLR), Vienna, Austria, May 2024
- Neural Information Processing Systems (NeurIPS), New Orleans, USA, Dec 2023
- Computational Cognition Conference, Osnabrück, Germany, Oct 2023
- German Conference on AI (KI), Berlin, Germany, Sep 2023

## ACADEMIC SERVICE

### Peer Reviewer

- BMC Medical Informatics and Decision Making, 2023
  - Evaluated manuscripts in medical informatics, focusing on applying decision-making algorithms in healthcare.
- ICLR 2024 Tiny Papers, 2023
  - Reviewed submissions for the Tiny Papers track, focusing on concise and impactful research in deep learning.
- Nature Scientific Reports, 2023
  - Assessed research articles for one of the leading journals in scientific reporting, covering a wide range of deep learning topics.

## SUMMER SCHOOLS

- **The MUST Deep Learning Bootcamp, North-West University, South Africa, January 2025**
  - Covered deep learning fundamentals including supervised learning, linear regression, gradient descent, overfitting, and underfitting. Explored advanced topics such as maximum likelihood estimation, optimization algorithms (SGD, Adam), regularization techniques, and convolutional neural networks.
- **Mediterranean Machine Learning School, Milan, Italy, September 2022**
  - 5-day event covering keynotes, lectures, and hands-on sessions on cutting-edge deep learning research and applications.
- **Neuromatch Academy: Deep Learning, Online, July 2022**
  - 3-week intensive online program learning of theoretical and practical approaches to deep learning, from data to models.
- **Eastern European Machine Learning Summer School, Ljubljana, Slovenia, July 2021**
  - Covered deep learning’s breadth and depth, including backpropagation, attention, and reinforcement learning.
- **Machine Learning Summer School, Bandung, Indonesia, August 2020**
  - Learned fundamentals and advanced topics including TensorFlow, CNNs, VAEs, NLP, and transfer learning.
- **Oxford Machine Learning Summer School, Oxford, United Kingdom, July 2020**
  - Courses in Bayesian ML, computer vision, NLP, reinforcement learning, causal and transfer learning.

## LEADERSHIP

- **Graduate Assistant Initiative Network (GAIN), Osnabrück, Germany**
  - Co-founded and led an international mentorship network for underrepresented groups
  - Recruited and guided 100+ volunteers across 20+ countries
  - Matched 100+ mentee-mentor pairs annually, organized events for 300+ participants
- **African Accents International NGO, Makeni, Sierra Leone**
  - Co-founded and directed activities, secured grants
  - Trained 700+ youth in technical and vocational skills
- **University of Makeni Computer Science Society President, Makeni, Sierra Leone**

– Led the society, organized STEM outreach and public debates

## **NETWORKS AND MEMBERSHIP**

- **Gesellschaft für Informatik e.V.**, April 2024 - Present
- **Black in AI**, January 2022 - Present
- **African Institute of Mathematical Sciences (AIMS) Community**, July 2020 - Present
- **The Association of Commonwealth Universities (ACU) Alumni**, August 2020 - Present
- **IEEE Student Member**, February 2019 - Present