Community of Practice: Artificial Intelligence in Bioinformatics

August 5, 2025

1. Purpose

The Community of Practice (CoP) on Artificial Intelligence (AI) in Bioinformatics aims to foster inter-disciplinary collaboration, knowledge sharing, and capacity building at the intersection of AI and Bioinformatics across Africa and with diaspora networks. It aims to gather a diverse and interdisciplinary community from both academia and industry, including researchers, experts, practitioners, data engineers, students, learners, policy makers and funders, to enable the cross-pollination of ideas and the co-creation of solutions to drive locally relevant AI innovation in bioinformatics across the continent.

Objectives:

Objective 1: Build a network of African researchers, educators, practitioners, and students working or interested in AI applications to bioinformatics.
Objective 2: Promote the development and adaptation of AI tools and ensure that advances in AI research translate into solutions tailored to African biological data and health challenges.
Objective 3: Facilitate capacity building through training, mentorship in AI applications to bioinformatics.
Objective 4: Advocate for investment and infrastructure, highlighting the importance of data science and bioinformatics for the continent's development.
Objective 5: Ensure that African expertise contributes significantly to global advances in AI-driven bioinformatics.

2. Scope of Work

Inclusions

1) Mapping and evaluation of AI applications in bioinformatics across Africa.
2) Development of teaching resources, training workshops, webinar series, and mentorship programs on AI and bioinformatics tools.
3) Development of shared resources including a repository of best practices and publications, as well as machine learning tools and pipelines for bioinformatics tasks and for low-resource environments.

4) Promotion of inter-disciplinary and cross-institutional collaborative projects across the continent and with diaspora networks, such as the use of AI in infectious disease modeling, precision medicine, agriculture, or biodiversity.
5) Promotion of responsible and ethical use of AI in bioinformatics in African contexts.
6) The topics of interest include (but are not restricted to):
    - AI in biomedical and medical informatics
    - AI in drug discovery
    - AI in pathogen surveillance
    - AI in omics data analysis
    - AI in agricultural biotechnology
    - AI in structural biology
    - Ai in animal welfare
    - Ai in biomarker discovery

Exclusions:

1) Activities aimed at private profit without community benefit
2) Direct funding allocation or grant administration
3) Research that does not intersect with either AI or bioinformatics
4) Theoretical AI/machine learning work not grounded in biological or biomedical data

3. Membership and Participation

a) *Eligibility:* Voluntary and open to individuals with interest or expertise in AI applications in bioinformatics, or related areas.
b) *Composition:* Researchers in bioinformatics, molecular biology, public health, and medicine; experts in AI, machine learning, and data science; professionals in biomedical and health informatics; computer scientists and data engineers; practitioners; students and learners from both academia and industry; as well as policymakers and funders.
c) *Meeting Frequency:* Monthly virtual meetings with optional yearly in-person or hybrid sessions.
d) *Attendance Expectation:* Regular participation is encouraged. Members attending fewer than 50% of meetings over six months may be asked to review their capacity to contribute.

4. Roles and Responsibilities

Chair/Co-Chairs:

1) Lead and facilitate meetings.
2) Develop agendas and oversee execution of the work plan.
3) Represent the CoP in external engagements

Regional chairs:

1) Represent the region in CoP steering meetings.
2) Coordinate regional events.
3) Identify regional needs and relevant resources and feed them into the broader CoP work plan.
4) Disseminate CoP outputs and calls in regional networks.

Members:

1) Actively participate in meetings and discussions.
2) Volunteer to join working task forces and contribute to deliverables.
3) Communicate availability and progress on tasks.

Secretariat (Optional):

1) Coordinate administrative tasks (e.g., scheduling, minutes, communications).
2) Maintain the CoP document repository, and disseminate key materials to members
3) Role to be filled voluntarily and rotated yearly.

5. Governance and Decision-Making

Decision-Making Mechanism:

1) Consensus is preferred for major decisions.
2) Where consensus is not possible, a simple majority vote will be applied.
3) Advisory recommendations may be developed for external stakeholders.

Quorum: Minimum of 50% of active members present.

Conflict Resolution:

1) Differences will be addressed through facilitated discussion.
2) If unresolved, issues will be escalated to a neutral oversight group or external advisor.

6. Deliverables & Timeline

Deliverable	**Start Date**	**End Date**
Establishment of CoP and Finalized ToR	July 2025	August 2025
Online platform for member engagement	August 2025	October 2025
Inaugural capacity-building online meeting – Formation of working groups	October 2025	November 2025

Identification of stakeholders – Survey and interviews	September 2025	January 2026
Initial draft of mapping report of AI-bioinformatics trainings and projects across Africa	January 2026	February 2026
Presentation of finalized mapping report in online meeting	February 2026	March 2026
Publication of policy brief and public map/database	March 2026	April 2026
Regional workshops, presentations, and design of training, mentorship programs based on results	April 2026	July 2026

7. Review and Revisions

This ToR will be reviewed **annually** or upon the completion of major milestones, with updates made based on evolving priorities, member feedback, and broader scientific or policy developments.

List of Contributor(s)

No.	Name	Affiliation	Specialization	Interest	e-mail
1.	Aida Ouangraoua	Université de Sherbrooke, Université de Ouagadougou (from November 2025)	Algorithms, AI, Comparative genomics, RNA bioinformatics, Phylogenomics	Data Science, Bioinformatics, Genomics, & Transcriptomics	Aida.Ouangraoua@gmail.com
2.	Mahmoud ElHefnawi	National Research Centre	Machine learning , RNA bioinformatics, gene therapy, Drug design, metagenomics, integrative bioinformatics	Transcriptomics, bioinformatics, biomedical informatics, drug discovery, gene therapy	Mahef111@gmail.com
3.	Musalula Sinkala	University of Cape Town	Bioinformatics, AI, Systems Biology	Bioinformatics, AI/ML, OMICS, Cell Signalling,	musalula.sinkala@uct.ac.za

				Population genetics	
4.	Caroline Ross	University of Cape Town	Structural bioinformatics, RNA biology, comparative genomics, algorithm development	RNA function and evolution in disease contexts. Developing RNA therapeutics. Transcriptomics, sequence analysis, RNA structure prediction	caro.ross@uct.ac.za
5.	Marion Adebiyi	Nile University of Nigeria, Abuja. Nigeria	Computer Science, Artificial Intelligence, Analytics Machine Learning Bioinformatics Organism's Inter-pathway Analysis	Data Analytics, Bioinformatics, Proteomics, Homology Modeling,	marion.adebiyi@nileuniversity.edu.ng
6.	Abdoulaye Baniré Diallo	université du Québec à Montréal Cité des sciences et de l'innovation de Guinée	AI in Life science, Bioinformatics	evolution and phylogenetic SmallRNA Precision Ag Behavioral analysis and welfare	banire@csiguinee.org Banire@gmail.com
7.	Thommas Mutemi Musyoka	Kenyatta University	Bioinformatics Chemoinformatics CADD Genomics	AI in Drug Discovery AMR/One Health	Thommas Mutemi Musyoka mutemibiochemistry@gmail.com musyoka.thommas@ku.ac.ke
8.	Bakary N'tji Diallo	University of Science Techniques and Technologies of Bamako (USTTB)	Bioinformatics - Structural Bioinformatics In-silico Drug Discovery Cheminformatics	Quantum Chemistry ML-AI in life sciences Genomics	diallobakary4@gmail.com bndiallo@icermali.org