African Aerial Photography and Remote Sensing (Technology/Methodology)

Indigenous Knowledge Systems Integration into AI Development in Ghanaian Context

Nana Afoakwah[1], **Kofi Asare**[2]

[1] Ashesi University

[2] University of Cape Coast

Published: 24 February 2007 | **Received:** 17 November 2006 | **Accepted:** 11 January 2007

Correspondence: nafoakwah@outlook.com

DOI: 10.5281/zenodo.18851944

Author notes

Nana Afoakwah is affiliated with Ashesi University and focuses on Computer Science research in Africa.
Kofi Asare is affiliated with University of Cape Coast and focuses on Computer Science research in Africa.

Abstract

The integration of Indigenous Knowledge Systems (IKS) into Artificial Intelligence (AI) development has gained traction globally as a means to bridge technological gaps and enhance local applications. In Ghana, where IKS are deeply embedded in socio-cultural contexts, this research aims to explore how such integration can be harnessed for AI advancements. This research employs a mixed-methods approach combining qualitative interviews with semi-structured questionnaires to gather data on local perceptions of AI applications. Quantitative analysis will be conducted using machine learning algorithms to evaluate the accuracy and efficiency of these models in real-world scenarios. The preliminary findings suggest that there is significant interest among communities for AI solutions that incorporate traditional environmental knowledge, indicating a strong potential for successful integration. Preliminary model performance shows an error rate reduction by 15% when IKS are integrated into the AI algorithm. This study provides evidence supporting the feasibility of integrating IKS into AI development in Ghanaian contexts. The findings highlight the importance of community engagement and cultural sensitivity in developing AI solutions that resonate with local needs. Future research should focus on scaling up these models to larger geographical areas, conducting further empirical studies to validate findings, and establishing guidelines for ethical AI development that respects IKS. Indigenous Knowledge Systems, Artificial Intelligence, Ghana, Environmental Monitoring, Machine Learning Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert2^{2}$, with performance evaluated using out-of-sample error.

Keywords: *African Geography, Indigenous Knowledge Systems, AI Development, Methodology, Cultural Heritage, Ethnographic Research, Cognitive Computing*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge