

Michael L. Mann  
The George Washington University  
Washington, DC 20052  
Email: mmann1123@gwu.edu  
3/5/2025

**Subject:** Submission of Manuscript: *“Lite Learning: Efficient Crop Classification in Tanzania Using Feature Extraction with Machine Learning & Crowd Sourcing”*

Dear Editor,

I am pleased to submit our manuscript, *“Lite Learning: Efficient Crop Classification in Tanzania Using Feature Extraction with Machine Learning & Crowd Sourcing,”* for consideration in *JSTARS*. This study introduces a **novel time-series feature extraction approach** for crop classification using **xr\_fresh**, a new Python module designed for geospatial time-series analysis.

**Key Contributions:**

- **xr\_fresh** automates the extraction of **50+ time-series metrics** (e.g., trend, variability, complexity) from Sentinel-2 imagery, optimizing temporal data for machine learning.
- Our approach **outperforms traditional land cover models**, achieving **Cohen’s Kappa of 0.82 and F1-micro score of 0.85**, while remaining computationally efficient.
- We integrate **YouthMappers crowdsourced field data** with time-series features to improve model generalization in **data-scarce agricultural regions**.

This methodology offers a scalable, interpretable alternative to deep learning in low-data environments, making it highly relevant to *JSTARS*’ focus on remote sensing applications for agriculture and food security. We appreciate your time and consideration and look forward to your feedback.

Sincerely,

Michael L. Mann, Ph.D.  
The George Washington University  
Washington, DC 20052  
mmann1123@gwu.edu

See my free textbook on geospatial python: <https://pygis.io>.