Title: AI Assisted Digital Lensless Microscope to detect MF

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KEYWORDS: Microfilariae, Lymphatic filariasis, microscope, Nocturnal periodicity

DOMAIN: Optoelectronics

SUMMARY:

An AI-assisted microscope can be employed as a diagnostics tool to analyze microfilariae (MF) in blood samples. MF causes Lymphatic filariasis (LF), and the existing microscopic techniques have logistical problems due to its nocturnal periodicity. Hence the smart microscope addresses these drawbacks to detect MF using AI-assisted digital lensless microscopy. The microscope can be operated with minimum technical knowledge. Its operating principle relies on the interpretation of the morphological features obtained from the diffraction image pattern of the blood sample. The processor is coupled with a learning engine (Machine learning or deep Learning) to analyze these morphological features to identify associated filarial parasites and to capture the LF's severity.

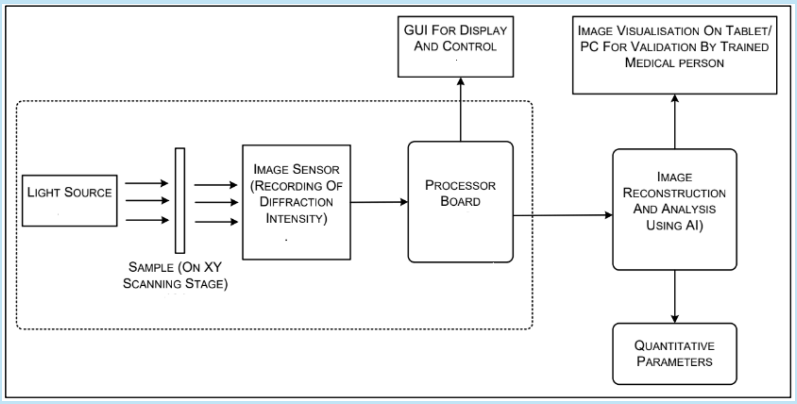

Figure: Exemplary view of smart microscope and description of operational mechanism

ADVANTAGES:

1. Reduction in Logistic Complexity: The smart microscope can streamline and simplify the logistical challenges
2. Software Upgradability: The system allows for seamless software upgrades, ensuring it remains current with the latest technological advancements.
3. Minimal Human Interference: The device operates with little to no need for human intervention.
4. Remote Access and Analysis: Expert technicians can perform remote visualization and analysis which reduces the need for trained experts.

APPLICATION: Detection of lymphatic filariasis-associated microfilariae

SCALE OF DEVELOPMENT: The functional prototype of the product is developed at a lab scale.

TECHNOLOGY READINESS LEVEL: TRL 4

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