Convolutional Neural Networks Applied to Hematological Analysis

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This project presents the development of three AI-powered diagnostic tools capable of identifying malaria, leukemia, and anemia from peripheral blood smear (PBS) images using convolutional neural networks (CNNs). Each model was trained on thousands of pre-processed blood smear images and validated using reliable performance metrics, achieving over 93% accuracy across all conditions. The system incorporates image preprocessing techniques—including masking and segmentation—and automates blood smear classification through compact CNN architectures optimized for speed and efficiency. Designed for deployment on affordable, portable hardware , the tools deliver diagnoses in under 10 seconds without the need for internet, lab equipment, or expert supervision. Comparative analysis with traditional methods reveals significant improvements in speed, cost, and accessibility. By offering rapid, reliable diagnostics in a low-power, field-ready format, this technology holds promise for expanding diagnostic access in underserved regions and improving global healthcare.

Awards Won: