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Prediction of Disease from Blood Microscopic Analysis Classification using Deep Learning Algorithm

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Abstract: *Traditional blood disease detection based on visual inspection of blood smears using a microscope is time consuming, error-prone, and limited by the physical acuity of the hematologist. To facilitate clinical decision-making, an automated optical image processing system is required. Leukemia is a kind of cancer that is distinguished by the aberrant development of immature, abnormally shaped white blood cells (WBC) known as "blasts." Leukemia is a cancer of the white blood cells (WBCs) that affects the bone marrow and/or blood. A timely, safe, and accurate diagnosis of leukemia at an early stage is critical to treating and preserving patients' lives. The white blood cells in a blood smear are often examined under a microscope to determine the diagnosis.Many machine learning have been created to diagnose various illnesses, such as leukemia, and to deliver a high mis-classification error rate. As a result, we may use a deep learning system to identify microscope pictures for White Blood Cell Count study. The WBC differential counting system was divided into two modules: detection and classification. The detection module first processed the raw bone smear pictures, detecting all WBCs including red blood cells, platelet counts, staining impurities, and so on. The discovered cells were then sent into the categorization module.The categorization module was divided into two phases. In the first step, we separated a large number of cells, such as crushed cells, degenerated cells, and so on, that are not employed in the diagnosis for leukemia. The countable WBCs were then presented for multi-class separation using the Convolutional neural network technique in the second step.*

Keywords: Blood disorders, White blood cells, Classification, Machine learning, Deep learning, Leukemia

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