Using Convolutional Neural Networks (CNN) Image Recognition to Program the Artificially Learned C3BO: Cancer Blood Oncologist

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According to the National Cancer Institute, over 170,000 people in the United States are affected by some type of blood cancer accounting for approximately 3% of all cancer types diagnosed in adults and being the most common type of cancer in children. Most cases can only be treated effectively if diagnosed early. Unfortunately, accurately identifying blood cancer through manual inspection can take months or even years. The purpose of this project was to use machine learning to create a more efficient way of diagnosing blood cancer. First, a public file containing images of more than 16,000 patients' cells was downloaded for binary classification. Inspired by Star Wars' genius robot C-3PO, C-3BO (Cancer Blood Oncologist) was created and trained to diagnose leukemia. Then, a convolutional neural network (CNN) architecture for C-3BO was designed to recognize and classify, with high confidence, healthy and cancerous cells. Once C-3BO proved to be an expert at classifying leukemia, the code was developed on a user-friendly app tested by mock patients. On the app, C-3BO requests the patient to input a file containing images of their cells and announces whether or not that patient is likely to have blood cancer. Compared to traditional means of blood cancer-testing adopted by oncologists, which predict on average 74% of blood cancer, this model surpasses that accuracy with approximately 83% accuracy. The data generated and displayed by the model's training history and Matplotlib respectively, demonstrated that AI-powered cancer detectors are faster and more reliable than currently used means.

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