

Smart cameras in rapid medical diagnostics

Using Imaging Diagnostics' Professional USB 2.0 camera, DiaMed was able to develop and build an accurate and cost effective hand held malaria diagnostic device.



Background

Malaria and other infectious diseases are rampant in developing countries, and medical facilities are unable to keep up with the growing need for immediate and accurate diagnostic testing.

DiaMed Rapid Tests were developed to reach this critical market providing quick on-site diagnosis to replace, or act as a preliminary step to, costly laboratory testing.

Problem

Although rapid malaria tests are 90% accurate, the results are difficult to read and there is a high instance of user error, resulting in misdiagnosis and improper treatment. A solution was needed to help field technicians properly diagnose patients and begin treatment on time.

Camera Specs	
DSP	BF531
Sensor	1.3mp color
Software	Custom development

Solution

DiaMed, a leading provider of diagnostic products, sought to create a cost effective, handheld, easy to use, highly accurate and durable device to overcome the inherent inaccuracies of the rapid malaria test. They turned to Imaging Diagnostics to develop an embedded vision solution that can process test results using image analysis, thereby eliminating the potential for human error and preventing misdiagnosis.

In order to satisfy DiaMed's power and size constraints of a hand held portable device, Imaging Diagnostics needed to provide a camera that possessed the requisite imaging

sensitivity along with the processing ability to enable quantitative determination of the level of infection.

With 15 years experience in machine building, specializing in embedded machine vision solutions for small mass produced devices, Imaging Diagnostics has developed the first line of Professional USB 2.0 cameras for high powered applications. By providing on-camera memory and processing, Professional USB 2.0 cameras overcome the traditional drawbacks of USB cameras, eliminating the need for expensive higher bandwidth connections.

By utilizing a professional USB 2.0 camera Imaging Diagnostics was able to maximize sensor performance, while collecting and processing all the necessary information in a compact and self-contained unit, and even added extra features such as advanced data management.

Working on a tight time and monetary budget, Imaging Diagnostics assembled a prototype based on their Camelot series, a line of professional USB 2.0 cameras with embedded Blackfin DSP's. The prototype transmitted images to an independent PC as a proof of concept, accelerating development time considerably. Once the camera and associated software were proven effective, the system was sent for clinical tests and evaluation. The final product is a totally independent embedded system with integrated keypad and display.

The use of a smart camera in this device eliminated the need for any other type of PC, further reducing production costs. Additionally, the custom software developed specifically for the application ensured ease of use, and seamless integration into the final product.

Summary

Utilizing a professional USB 2.0 camera enabled fast implementation of the vision solution. Imaging Diagnostics delivered a fully working product in only six months, enabling Diamed to fill the demand for an accurate, easy to use and cost-effective testing device.