

## Non – Invasive Bilirubin Detector with Phototherapy for Neonatal Jaundice

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**Abstract:**

Neonatal jaundice is one of the most common conditions affecting newborns worldwide. It results from elevated levels of bilirubin in the blood, often leading to visible yellowing of the skin and eyes. Early identification is crucial to avoid complications such as kernicterus or neurological damage. In this study, we propose a simple and cost-effective method for detecting signs of jaundice using a combination of camera-based imaging and basic color analysis. By capturing live skin images and analyzing them in color spaces such as YCbCr, RGB, and HSV, the system can differentiate between normal and jaundiced skin tones without invasive testing. When jaundice is detected, a signal is sent to an Arduino controller to activate an LED indicator, simulating the initiation of phototherapy treatment. The approach aims to offer a non-invasive, real-time screening tool, particularly useful in resource-limited settings where access to laboratory testing is delayed or unavailable. Our system is designed to assist healthcare workers and parents by providing an early warning, ensuring timely medical attention. Through careful calibration and analysis, this method demonstrates potential for improving neonatal care by making jaundice detection more accessible, affordable, and rapid.

**Keywords:**

Neonatal, bilirubin, phototherapy, jaundice, kernicterus.