Project Report on
“Design and Development of AI Based Portable Smart Oral Cancer Screening Device”

Submitted by:

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1. Introduction

Project is based on AI and IoT technology which have very high potential in medical field thus, the device should be low cost as well as handheld so that it is easy to use. The device will be designed for screening mouth tissue to prior determent of oral cancer. In this project we will use microcontroller, Camera, White LED light and Blue LED light. Device will use by dentist so its body should be autoclavable to maintain hygiene.

Currently, we have developed prototype device and working on take data for the further research.

The microcontroller will be used to control the camera and LEDs which was installed in it and IEEE Std 802.15.1 Bluetooth and IEEE 802.11 will use for data communication between device and smart phone application. First, device will connect to the mobile phone Application via Bluetooth and wi-fi. After that device camera will switch on and real time image of intraoral and whole cavity will be stream on mobile, further it will upload over cloud server to remote streaming. Image can be taken in white light and blue light to differentiate between bad tissue and good tissue so dentist will easily identify the bad tissue and go for proper treatment accordingly to save patient from oral cancer.

2. Prototype Device

![Prototype Device](image1)

![Block Diagram](image2)

Figure 1: A prototype Device

Figure 2: Block diagram of the working prototype device
3. Major Components used in prototype Device

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Components Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Microcontroller</td>
</tr>
<tr>
<td>2</td>
<td>LEDs</td>
</tr>
<tr>
<td>3</td>
<td>Push Buttons</td>
</tr>
<tr>
<td>4</td>
<td>Battery</td>
</tr>
<tr>
<td>5</td>
<td>Antenna</td>
</tr>
<tr>
<td>6</td>
<td>USB Port</td>
</tr>
<tr>
<td>7</td>
<td>Camera</td>
</tr>
</tbody>
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Currently device has been developed on zero PCB and now we are approach for 3D moulding of the device.

4. Some Image capture by the device

[Images of images captured by the device]

Figure 3: Image capture in different mode

5. Next Goal to Achieve

1. Test this device in presence of Dentists and experts
2. Collect image samples of patient
3. Make a finished device for commercialization
4. Use AI algorithm for the screening cancerous tissues
References: