



# **Sardar Patel Institute of Technology**

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**Innovation and Entrepreneurship Development Centre (IEDC)**

**Academic Year: 2015-2016**

## **ORAL VIEW- 360**

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# **1. INTRODUCTION**

Oral diseases are major public health problems due to their high incidence and prevalence across the globe with the disadvantaged affected more than other socio-economic groups. Sometimes patients need to visit a dentist even if they have a mild pain or even when something gets stuck between their teeth. Sometimes patients try to self-diagnose and treat themselves, unknowingly hurting their gums or teeth. In some cases a serious problem is ignored as a minor pain and becomes more serious and problematic.

The proposed solution consists of fitting a micro camera module on the toothbrush which will help the person examine their oral parts without damaging or hurting themselves.

People will not hurt themselves accidentally due to clear oral vision. Unwanted or minor visits to the dentists will be reduced to a great extent and problems can be treated at an early stage.

## **1.1 PROBLEM STATEMENT**

The problem of ...	Oral examination
Affects ...	Common people
And results in ...	Self-injury, frequent visits to the dentist
Benefits of a solution ...	Prevents self-injury, reduces unwanted clinic visits

## **1.2 BACKGROUND**

Sometimes patients need to visit a dentist even if they have a mild pain or even when something gets stuck between their teeth. Sometimes patients try to self-diagnose and treat themselves, unknowingly hurting their gums or teeth.

The solution is just visiting a dentist if a person has a sensation of pain. Brushing teeth and using a floss to remove stuck food particles is the only existing solution.

People use a mirror to get a better look inside their own mouth but the visibility is limited due to maximum capacity of the jaw to stretch open and also due to obstructed view because of the tongue.

### **1.3 NEEDS STATEMENT**

Patients need to visit the dentist even for minor issues. The dentists charge high rates even for just a word of consultation. It becomes very difficult for people who cannot afford such high consultancy rates. Thus, there is need for a solution to this socio-economic problem.

For detailed oral examination, the dentist inserts the mirror which provides a small view. OralView-360 is designed to provide much larger viewing angles and remote display capability.

### **1.4 OBJECTIVE**

- i. Toothbrush with a wireless camera that can stream live video to android application for recording or screen capture.
- ii. Waterproof and foam-proof capability.
- iii. Oral self-examination
- iv. Faster diagnosis

## **2. TECHNICAL IMPLEMENTATION**

The camera was interfaced with Raspberry Pi using SPI. When switched on, the raspberry pi creates a server through which the camera transmits the video feed. This video feed can be viewed on any operating system using its browser which acts as a client.

The server and camera capture settings can be adjusted suitably using the `motion.conf` file available with the `motion` library. Additional security features such as password protected feed can also be configured using this file.

### **2.1 PROPOSED DESIGN**

The Camera is mounted on the back side of the toothbrush with the LEDs surrounded as shown. The LEDs are mounted in such a way that their focal point coincides with that of the camera. The cleaning mechanism (not shown in the figure) consists of a shutter with a small sponge on the inner side which cleans the camera lens every time it is opened or closed.

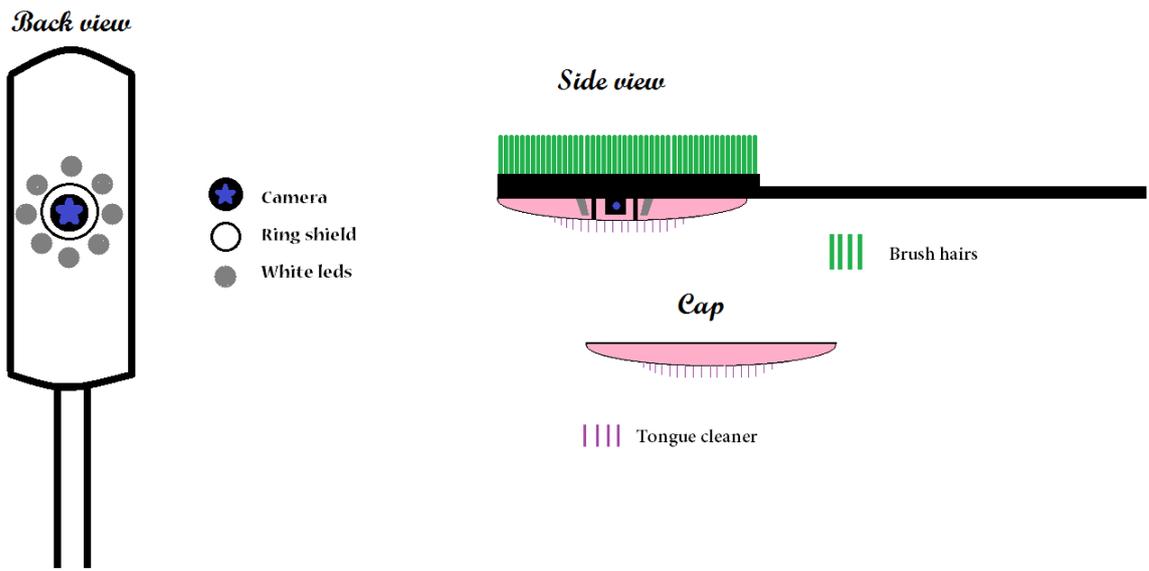


Figure 1

### 2.3 IMPLEMENTATION DESIGN

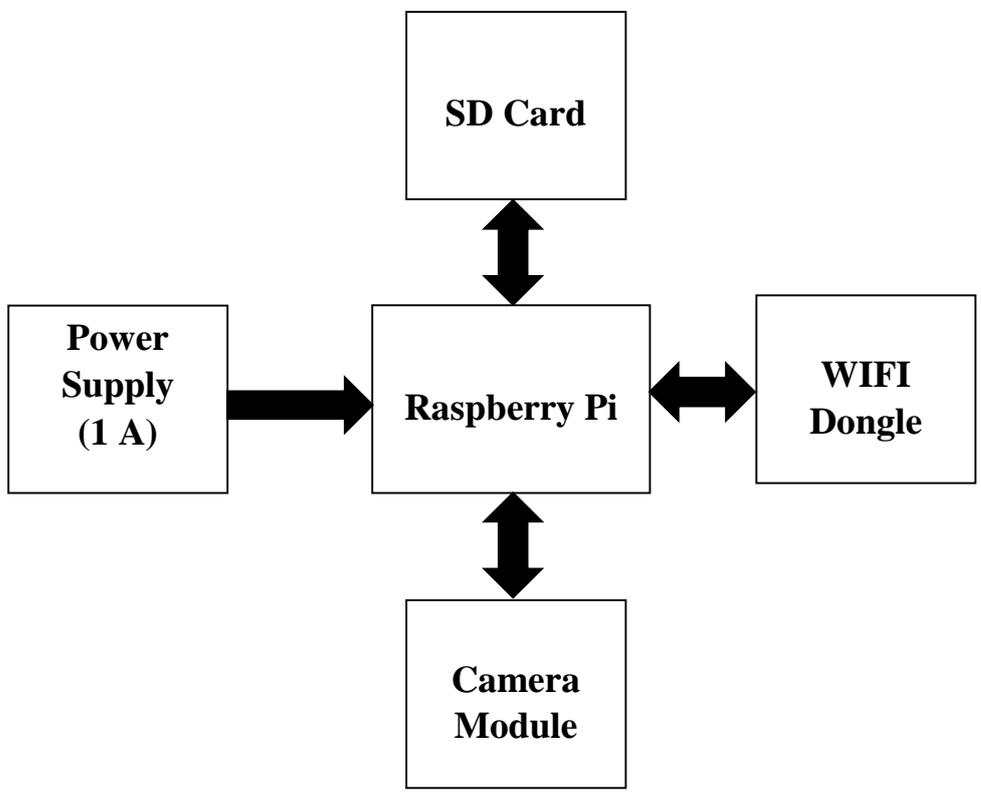


Figure 2

Power supply is used to provide 1 Ampere supply to the Raspberry Pi. It can be substituted using a battery source too. The SD Card contains the required firmware.

### **3. PROJECT RESULTS**

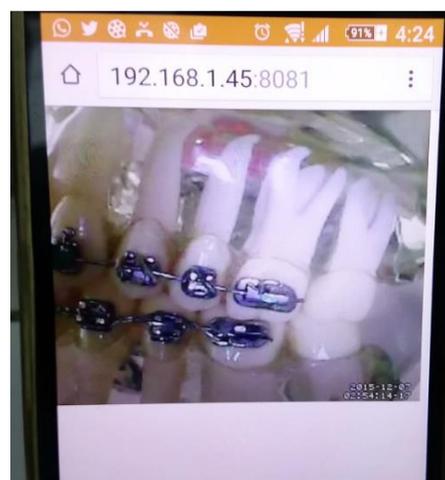
Video feed was successfully streamed live onto google chrome and mozilla firefox on linux, windows and android platforms. The method can be extended to implement security features and recording.



FIGURE 3



DENTAL MODEL

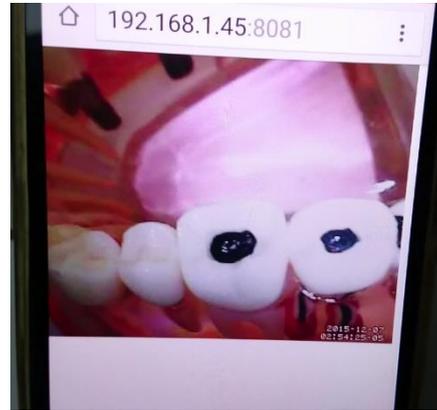


CAPTURED VIEW

FIGURE 4



DENTAL MODEL



CAPTURED VIEW

Figure 5



From Left to Right:  
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