



USER'S
MANUAL

Automated Speed
Trap

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USER'S MANUAL

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1.0 GENERAL INFORMATION

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General information section explains I general terms the system and the purpose for which it is intended.

1.1 System Overview

Automated speed trap is a project that is done to measure the speed of the vehicles that are moving along the road. Not only measuring vehicle speed but also It finds the vehicles that are moving higher than allowed speed and if a vehicle moves faster than the given limit, the system unit takes a photo of that specific vehicle and send that to the authorities to take whatever the required actions. As well as for the authorities there is a user friendly developed web interface.

1.2 Organization of the Manual

The user's manual consists of four sections: General Information, System Summary, Getting started, Using the System.

General Information section explains I general terms the system and the purpose for which it is intended.

System Summary Section provides a general overview of the system. The summary outlines the uses of the system's hardware and software requirements, system's configuration, user access levels and system's behavior in case of and contingencies.

Getting started section explains how to setup the system and add a unit to the central server.

Using the System section provides a detailed description of system functions.

2.0 SYSTEM SUMMARY

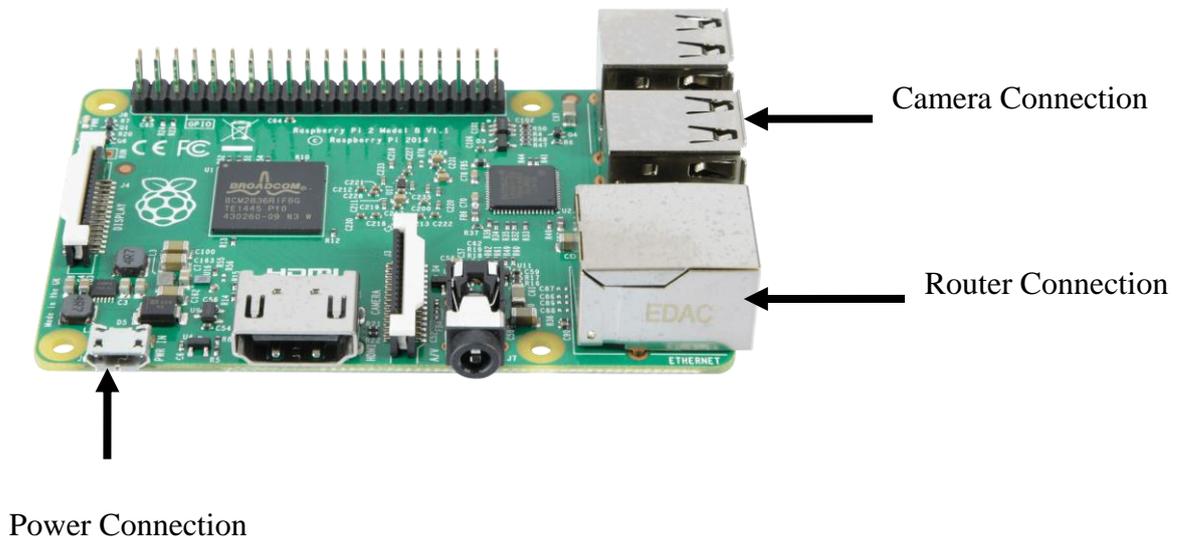
2.0 SYSTEM SUMMARY

System Summary Section provides a general overview of the system. The system outlines the uses of the system's hardware and software requirements, system's configuration, user access level and system's behavior in case of any contingencies.

2.1 System Configuration

The units in the Automated Speed Trap are operating separately after proper configuration. And each unit requires proper internet connection. So, each unit contains a routing item which transmits snaps and other details with central server. Any major internet browser has access to the central server under registered login values.

2.3 Connection Identification



2.2 User Access Levels

There are admin users who have access to all the features in the central server. Via one of the admin user, a new member can create an account for him. Everyone who has the registered account has access to the snaps and some other features. Only the authorized admins are able to delete snaps that are already in the list of snaps.

2.3 Contingencies

In case of power failure there is a battery contains which is able to run maximum of 3hrs. In case of network failure there is an internal memory which save snaps until network reboots. After network is available the saved photos are uploaded and deleted by themselves.

3.0 GETTING STARTED

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Getting Started section explains how a new unit is placed, configure that to the system and for a new user the behavior of the web application.

3.1 System unit

The system unit contains the hardware part that measuring vehicle speed and capturing snaps. As well as the uploading images to the central server is done via this system unit.

3.1.1 Initialization

Place the unit in proper location where able to measure speed from Doppler Sensor. (The Doppler Sensor is getting measurement when an object is moving 30m s ahead. Follow that.)

Power up the unit.

Connect camera to a device which (e.g. laptop) gives access to camera and by using that device manually focus the camera to the distance gives below equation.

After that connect camera to the unit again.

Take the unit ID that is mentioned below the unit.

3.1.2 Camera Focusing

Get the speed limit of the road

$$\text{Distance} = \frac{\text{Speed limit} * 10^3 * 200}{3600 * 1000}$$

Approximately the answer of above equation gives the distance that the camera focus placed on.

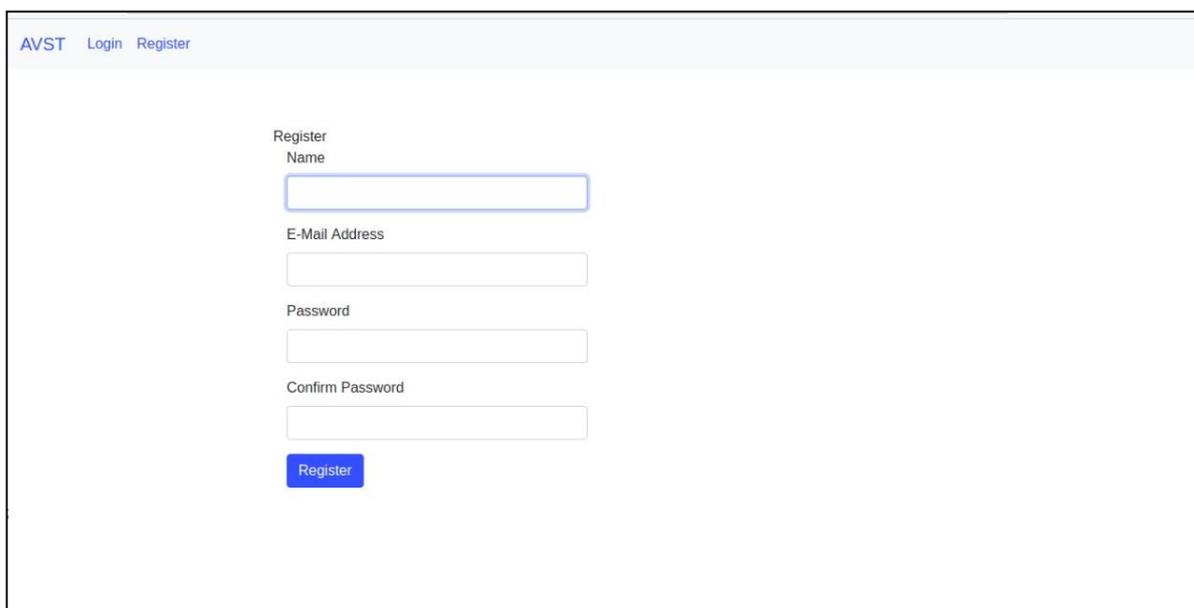
3.2 Web application

There is an admin user for central server. The admin user name and password will be given when the item is purchased. Via the web application all the details are handled.

3.2.1 Create Account

The following values are required for create new account and only the admin gets the feature to the create a new account for a new user.

The username, the email address, password and the confirmation password are required for creating new account.



The screenshot displays a web application interface for user registration. At the top left, there are navigation links: "AVST", "Login", and "Register". The main content area is titled "Register" and contains a form with the following fields:

- Name:** A text input field.
- E-Mail Address:** A text input field.
- Password:** A text input field.
- Confirm Password:** A text input field.

Below the form is a blue button labeled "Register".

3.2.3 Exit System

Exit the web application can be done simply log out from the web application

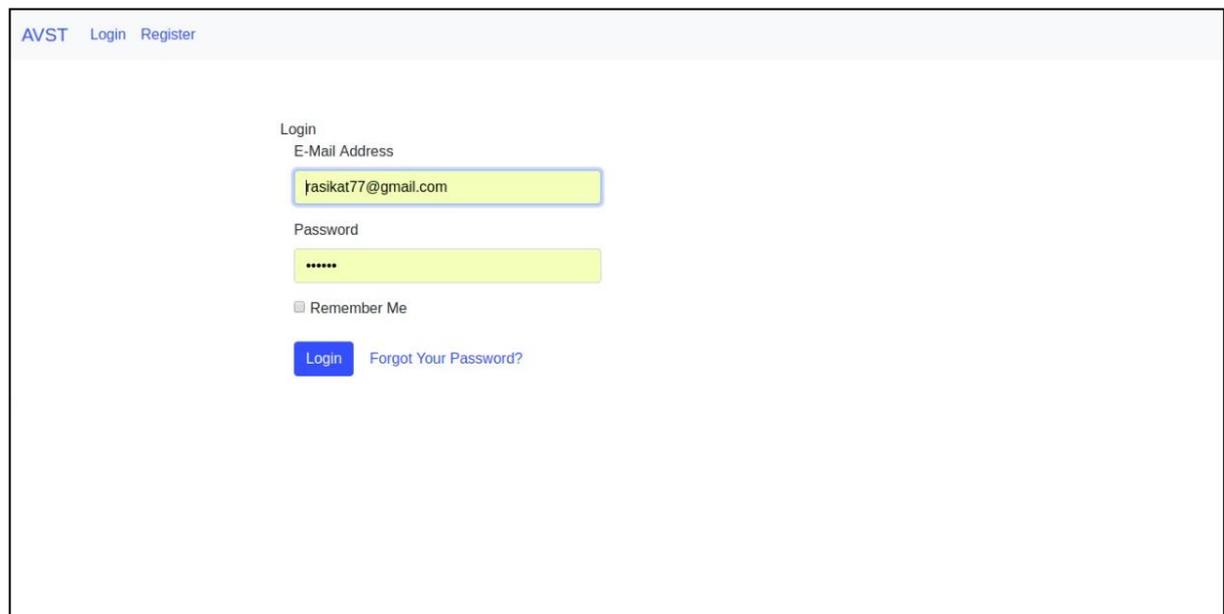
4.0 USING THE SYSTEM (ONLINE)

4.0 USING THE SYSTEM (ONLINE)

This section provides a detailed description of the system functions.

4.1 Login

With registered email and password, the user should log first to access features.



AVST Login Register

Login

E-Mail Address

jasikat77@gmail.com

Password

Remember Me

Login Forgot Your Password?

with the login, Remember Me and Forgot your Password features are added for considering users' relief.

4.2 Add new unit

When a new unit is fixed on any location, via web application it should be connected to the central server. For that following details should be filled. The location of the new unit can be set by simply clicking on a map provided.

Location, speed limit, unit ID are should be given manually and by pointing the location on the map, the longitude and latitude values are filled automatically.

The screenshot shows a web application interface for adding a new unit. The top navigation bar includes 'AVST', 'Home', 'Snaps', 'Software', 'Units', and 'Add unit'. A user profile 'rasika' is visible in the top right. The main form on the left contains the following fields:

- Location:
- Speed Limit:
- Longitude:
- Latitude:
- unitId:

An 'Add' button is located below the form. To the right is a Google Map of Sri Lanka with a red pin marker placed over the city of Colombo. The map shows major roads and cities across the island. The background of the page features a colorful, stylized city skyline.

4.3 Check Snaps

The snaps captured from system units are listed under snaps in the menu. The snaps are categorized under location ID which gives when a new unit is setup. There are locations listed under snaps and for each location, there is a button “Show” that displays the snaps of relevant location.

With the snaps the required details are given. Date and time, speed when the snap is captured, the speed limit of each location, are listed below each snap.

The screenshot shows the AVST application interface. On the left is a map of Peradeniya University with a red pin. On the right is a table with the following data:

#	Location	Max Speed	Lon/Lat	show	:	X
ee1233	Kandy	60	7.251983293416282 , 80.59347000595073	show..	:	X
1	Pera	55	7.248062422785082 , 80.59241032198406	show..	:	X
2544	Colombo	50	6.934175548054375 , 79.84299388791874	show..	:	X

And there is provided a search bar for find another location.

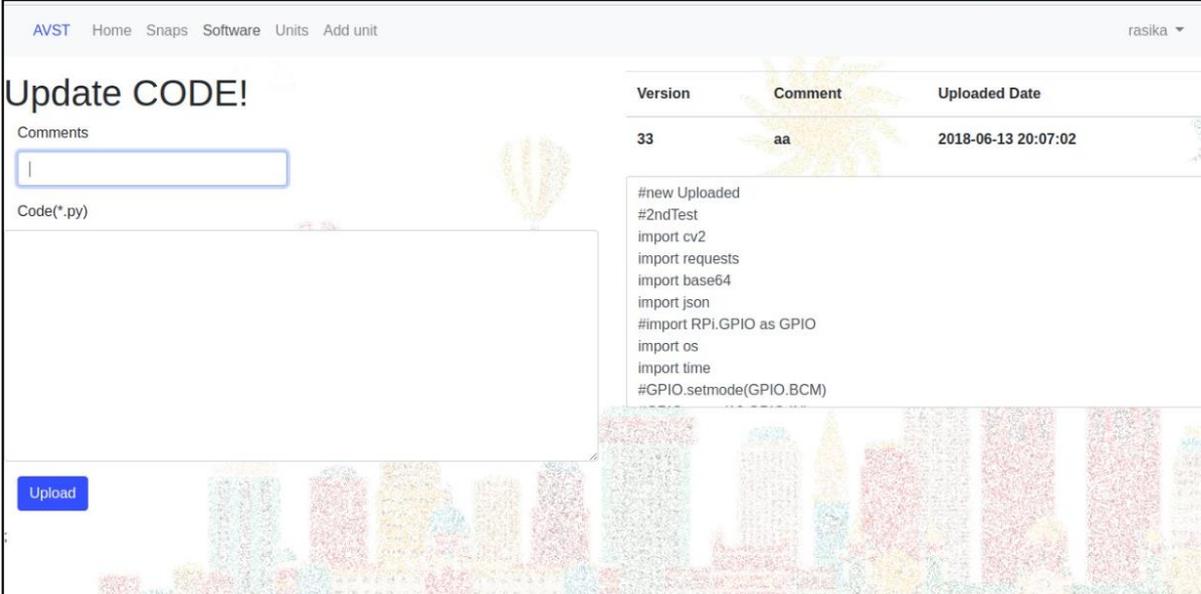
The screenshot shows the AVST application interface with a search bar at the bottom. Above the search bar are four panels, each displaying snap details for Kandy:

- Panel 1: Kandy, 2018-06-13 13:14:55, Speed:12, Speed limit:12. Buttons: open, X
- Panel 2: Kandy, 2018-06-13 12:53:39, Speed:12, Speed limit:12. Buttons: open, X
- Panel 3: Kandy, 2018-06-13 12:31:44, Speed:60mph, Speed limit:60mph. Buttons: open, X
- Panel 4: Kandy, 2018-06-13 12:29:48, Speed:60mph, Speed limit:60mph. Buttons: open, X

At the bottom, there is a search bar with the text "Location Search" and a "Search" button.

4.4 Upgrade Version

If there is a new version of the program that is already running in the Raspberry Pi, via under this it can be upgraded to the newest version by overriding the existing program. When the code is uploaded in here, all the units that are connected will be upgraded.



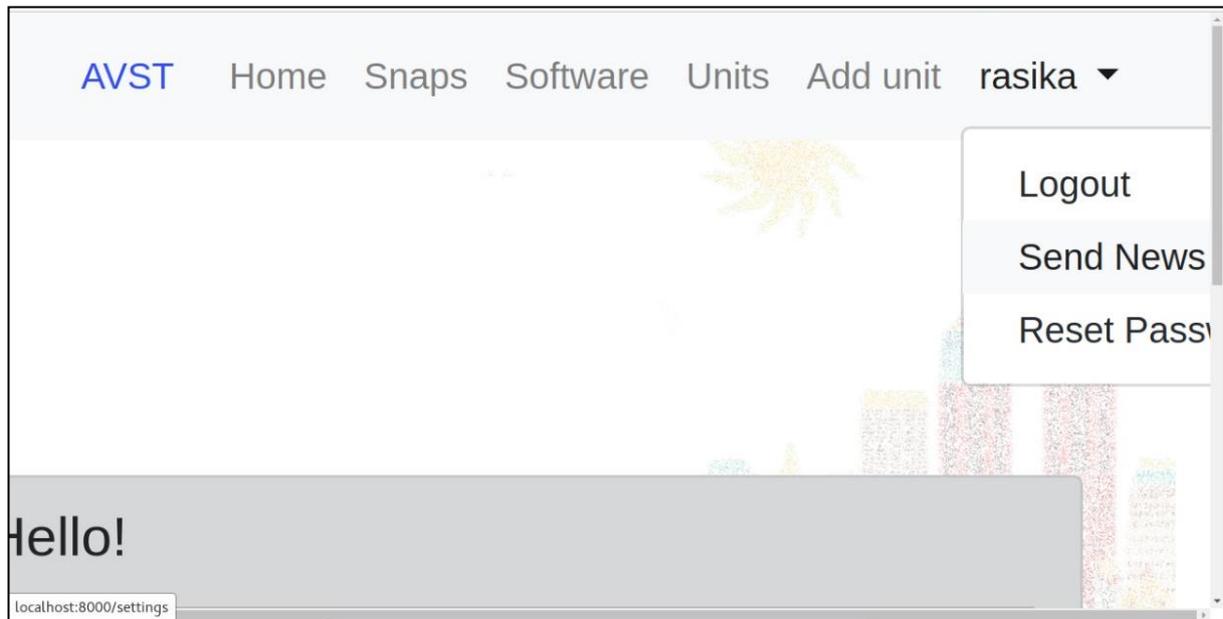
The screenshot shows the AVST web interface. At the top, there is a navigation bar with links for Home, Snaps, Software, Units, and Add unit. The user's name 'rasika' is visible in the top right corner. The main heading is 'Update CODE!'. Below this, there is a 'Comments' section with a text input field. Underneath the comments is a large text area for 'Code(*.py)'. A blue 'Upload' button is located at the bottom left of the code area. On the right side, there is a table with columns for 'Version', 'Comment', and 'Uploaded Date'. The table contains one entry with version '33', comment 'aa', and date '2018-06-13 20:07:02'. Below the table, there is a code editor showing Python code for GPIO setup.

Version	Comment	Uploaded Date
33	aa	2018-06-13 20:07:02

```
#new Uploaded
#2ndTest
import cv2
import requests
import base64
import json
#import RPi.GPIO as GPIO
import os
import time
#GPIO.setmode(GPIO.BCM)
```

4.5 Send News

If an admin wants to send a message to all the users, the “Send News” option gives that feature. This message is visible when a user logged in the web application.



4.6 Reset Password

If any user wants to reset his password, that feature is also included to the site.

4.7 Log Out

Log out function is given for each user.

