

**Installation & User Guide**

INTELLIGENT REASONING SYSTEMS (IRS)

**MTech (Intelligent Systems) AY2021/2022**

**Team KICS**

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Contents

[1 Objective 2](#_Toc102240517)

[2 System Overview 3](#_Toc102240518)

[3 Installation 4](#_Toc102240519)

[3.1 System Requirements 4](#_Toc102240520)

[3.2 Installation Steps 4](#_Toc102240521)

[3.2.1 Web Application Setup 4](#_Toc102240522)

[3.2.2 Chatbot and API Setup 5](#_Toc102240523)

[4 User Guide 8](#_Toc102240524)

[4.1 Obtain dimensions using Camera 8](#_Toc102240525)

[4.2 Obtain dimensions using Chatbot 9](#_Toc102240526)

[4.3 Search based on user preference 11](#_Toc102240527)

# Objective

This document aims to provide an overview of the ‘Optimum Parcels’ application, system requirements, and steps for the installation. It is assumed that the user understands python programming and knowledge reasoning and representation.

# System Overview

Below images illustrate an overview of the Optimum Parcels.

Diagram

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***The following technologies and tools are used to build the application:***

1. Django – Front and Backend integration
2. Dialog Flow – To identify users’ intent and support in measure of parcel sizes
3. 3D Bin Packing – 3DBP packing optimization software helps to choose the right box for every shipment
4. OpenCV – Camera measures with Aruco marker image to support users in measuring parcel size.
5. Google Sheets (for data sets) – Source of information for the price, insurance, re-delivery, home delivery etc.

Graphical user interface, application, Teams

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# Installation

## System Requirements

|  |  |
| --- | --- |
| Description | Technical Specification |
| Hardware | CPU: 1.6 GHz or faster, 2-core Intel Core i3 or equivalent  GPU: \*Optional  RAM: > 4 GB RAM  Hard disk: > 1 GB disk size |
| Software | OS: Windows 10 or Ubuntu 20.04  Software: Python 3 & above |
| Other Packages | All the required packages are included in requirements.txt. You can run ‘pip install -r requirements.txt’ to install all the required packages |

## Installation Steps

### Web Application Setup

**Step 1**:

Install python in your computer.

* <https://www.python.org/downloads/>

**Step 2**:

Use ‘git clone’ command to download the project from the following URL:

* Project URL link: <https://github.com/SionsML/IRS-PM-2022-01-29-IS04PT-KICS-Optimum_Parcels.git>

**Step 3**:

In the command line, change directory to the directory you have downloaded. In the same directory, run the following command:

* pip install -r requirements.txt

**Step 4**:

Type following commands to make migrations

* python manage.py makemigrations
* python manage.py migrate

**Step 5:**

Run the server with following command:

* py manage.py runserver

**Step 6:**

Application is now running in your local host. You can open your web browser and go to ‘http://127.0.0.1:8000/’ URL to use the application.

### Chatbot and API Setup

Follow the following steps to set up the chatbot on Dialogflow.

1. Go to <https://dialogflow.cloud.google.com/> and login using a Google Account.
2. On the welcome page, click **CREATE AGENT** button.
3. Give the agent in the *Agent name* field, confirm the Default Language and Time Zone, and Click **CREATE**.
4. One the agent is created, go to Agent settings by clicking on the gear next to the Agent name on top left of the page.

Graphical user interface, text, application

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1. Go to **Export and Import** tab.

Diagram

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1. Click RESTORE FROM ZIP. After this step, all the intents we built are in place.

Graphical user interface, text, application, email

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1. From the left navigation pane, go to **Fulfilment** page.

Graphical user interface, application

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1. Toggle Inline Editor to ENABLED.



1. Set up billing account on Google Cloud Platform. Credit card is needed but you will be given a 90-day trial with $300 credits and won’t be charged until you turn on auto-billing.

Graphical user interface, text, application

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1. Once billing is set up. Go back to the Fulfilment page. Paste the code from the two files from our repository into the two files accordingly:
   1. ../Chatbot/function-source/index.js
   2. ../Chatbot/function-source/package.json
2. Now the chatbot is setup on Dialogflow. If you would like to embed the chatbot in other web apps, you can get the following JavaScript from the Integration page.
   1. From the left navigation pane, go to Integrations page.

Graphical user interface, application

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* 1. Under the section for Text based integrations, select Dialogflow Messenger. This is important! The Web Demo integration does not give you the rich content of chips that we use in this project.

Graphical user interface

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Below is the integration code for our chatbot implementation.

|  |
| --- |
| <script src="https://www.gstatic.com/dialogflow-console/fast/messenger/bootstrap.js?v=1"></script>  <df-messenger    intent="WELCOME"    chat-title="EZCourier-Assistant"    agent-id="8ffd0f4e-36e5-40fb-9d1d-29dcde59aad8"    language-code="en"  ></df-messenger> |

For the Chatbot to be able to call the SheetDB and 3Dbinpacking APIs, they need to be set up accordingly as well.

**SheetDB:**

1. Upload the KB Excel as a Google Sheet to Google Drive and obtain the address.
2. Login to <https://sheetdb.io> using your Google account.
3. Put in the link to your Google Sheet and Create the API

Graphical user interface, application, Teams

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1. Copy the API endpoint and add it to the Dialogflow custom fulfilment code.

Graphical user interface, application

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**3DbinPacking:**

1. Register for a trial at [https://www.3dbinpacking.com](https://www.3dbinpacking.com/)
2. Obtain the API Key from the Profile page for the Dialogflow custom fulfilment implementation.

Graphical user interface, text, application, email

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# User Guide

Optimum Parcel offers solution to users who are unaware of their parcel sizes, and what would be optimum choice in terms of the users’ preference (price, re-delivery, insurance, home delivery etc.)

In the case user is not aware of the parcel’s size (height, length, and width), we are providing two options for users to measure.

1. This application will use object detection model using OpenCV and Aruco marker to measure item’s height, length, and width.
2. Dialog flow chatbot which will also use 3D Bin Packing API webhook to identify the item based on user’s input.

First question we ask is whether user is aware of parcel’s dimension. If ‘no, I need help’ radio button is clicked, it will show options for ‘Camera Measure’ and ‘Talk to EZBot’.Graphical user interface, website

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## Obtain dimensions using Camera

1. When user clicks on Camera Measure, below modal will pop up with instructions.

Qr code

Description automatically generated

You can click on image of Aruco Marker to download it and follow instructions to print the Aruco Marker in white paper and use it to measure dimensions of your parcel with your camera.

2. Download iVCam

iVCam turns your Phone/Pad into an HD webcam for Windows PC, which has a much better quality than most webcams and is compatible with all webcam-enabled applications. User can connect either via Wi-Fi, or via USB cable.

A screenshot of a cell phone

Description automatically generated with low confidence

Kindly check the official documentation via this link (https://www.e2esoft.com/ivcam/)

## Obtain dimensions using Chatbot

Interaction with the chatbot is intuitive. Sufficient instructions are provided to the user in the bot itself so the user should know exactly what to do to get recommended sizing. Below shows the start page (Welcome Intent) of the chatbot. User can just choose from the list by clicking on the buttons.

Graphical user interface, text, chat or text message

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Each step of the way, users are guided by further chips (buttons).

Graphical user interface, text, application, chat or text message

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Of course, there are cases where users need to provide input directly by typing it in.

Graphical user interface, text, application, chat or text message

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The user can provide input in natural language form. In the example above, user can say “just 2”. The chatbot, thanks to Google, is intelligent enough to pick up 2 as the quantity and will perform data retrieval and processing to return the recommendation to the user.

Graphical user interface, text, application, chat or text message

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## Search based on user preference

Based on height, width, and length obtained from previous steps, User can provide inputs and system will automatically calculate volumetric weight as per below. User can also provide what is most important aspect for them in terms of below options

1. Price
2. Insurance
3. Re-delivery
4. Home delivery
5. Delivery date

Graphical user interface, application

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System will list all available courier options based on user’s preference. In this case, price is selected as user’s most important factor for their courier choice thus SingPost which has lowest price offered was displayed in the top.

A screenshot of a computer

Description automatically generated

If user selects re-delivery as most important factor for his choice, table displayed will show courier which has highest re-delivery option available as per below.

A screenshot of a computer

Description automatically generated

User can further filter the search result by using price range or insurance/home delivery requirements.

Graphical user interface, application

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