

User Manual

Table of Contents

- 1. [Introduction](#)
- 2. [System Requirements](#)
- 3. [Installation](#)
- 4. [Running the Application](#)
- 5. [Using the Application](#)
- 6. [Troubleshooting](#)
- 7. [FAQ](#)
- 8. [Support](#)

1. Introduction

This user manual provides step-by-step instructions on how to install, configure, and use the application. The application consists of a front-end built with React, a back-end built with Flask, and a simulation environment using CoppeliaSim.

2. System Requirements

- Operating System: Windows, macOS, or Linux
- Python 3.x
- Node.js and npm
- CoppeliaSim (Version 4.7.0 or higher)

3. Installation

3.1 Install Python and Virtual Environment

- 1. Download and install Python from [python.org](#).
- 2. Open a terminal or command prompt.
- 3. Navigate to the project directory.
- 4. Create a virtual environment:

```
python -m venv .venv
```

- 5. Activate the virtual environment:

- On Windows:

```
.venv\Scripts\activate
```

- On macOS/Linux:

```
source .venv/bin/activate
```

6. Install the required Python packages:

```
pip install -r requirements.txt
```

3.2 Install Node.js and React

1. Download and install Node.js from nodejs.org.
2. Open a terminal or command prompt.
3. Navigate to the `src/frontend` directory:

```
cd src/frontend
```

4. Install the Node.js dependencies:

```
npm install
```

3.3 Install CoppeliaSim

1. Download and install CoppeliaSim from coppeliarobotics.com.
2. Open a terminal or command prompt.
3. Copy the Lua scripts to your CoppeliaSim installation directory:

```
cp -r Lua/ [CoppeliaSim-directory]/
```

4. Open CoppeliaSim.
5. Load the scene file:
 - Go to File → Open Scene.
 - Navigate to and select the scene file `Group 5 simulation.ttt`.

4. Running the Application

4.1 Activate the Environment

1. Open a terminal or command prompt.
2. Navigate to the project directory.
3. Activate the Python virtual environment:
 - On Windows:

```
.venv\Scripts\activate
```

- On macOS/Linux:

```
source .venv/bin/activate
```

4.2 Start the Front-end

1. Open a terminal or command prompt.
2. Navigate to the `src/frontend` directory:

```
cd src/frontend
```

3. Start the React application:

```
npm start
```

4.3 Activate Flask

1. Open a terminal or command prompt.
2. Navigate to the project directory.
3. Start the Flask server:

```
python main.py
```

4.4 Start the Simulation

1. Open CoppeliaSim.
2. Load the project scene.
3. Click the Start Simulation button or press `Ctrl+P`.

5. Using the Application

1. Open your web browser and navigate to the front-end application.
2. Interact with the front-end to control the simulation.
3. The Flask server handles back-end operations and communicates with the simulation.
4. Use the simulation controls in CoppeliaSim to manage the simulation environment.

6. Troubleshooting

- Ensure all dependencies are installed correctly.

- Verify that the virtual environment is activated.
- Check for any error messages in the terminal and address them accordingly.
- Ensure the Flask server is running before starting the simulation.

7. FAQ

Q: How do I update the Python packages? **A:** Run `pip install -r requirements.txt` in the activated virtual environment.

Q: How do I update the Node.js dependencies? **A:** Navigate to the `src/frontend` directory and run `npm install`.

Q: How do I reset the simulation? **A:** Reload the scene file in CoppeliaSim and restart the simulation.

8. Support

For additional support, please contact the project maintainers or refer to the project's documentation.