



## **Hands UP**

### Technical Installation Manual

Updated: 29/09/2025

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# 1 Introduction

Hands UP comprises:

- A React frontend
- A Node.js API for database access
- A FastAPI service for sign language translation

For each of these components, the following must be installed:

1. React app – Node packages
2. Node.js API – Node packages
3. FastAPI – Python libraries

## 2 Prerequisites

The following programs must be installed before attempting to set up Hands UP.

### 2.1 Text Editor

We recommend using the **latest version** of VS Code:

1. Navigate to: <https://code.visualstudio.com/download>
2. Download the installer for your operating system.
3. Run the installer with default settings.

### 2.2 Python

The required version is **Python 3.11**. Ensure no other Python 3 version is installed.

#### 2.2.1 Windows and macOS

1. Download from: <https://www.python.org/downloads/release/python-3110/>
2. Scroll to the “Files” section and select the installer for your system.
3. During installation, **check the box to add Python to PATH**.
4. Complete the installation with default settings.

### 2.2.2 Linux

Run the following commands:

Listing 1: Python Installation

```
1 sudo add-apt-repository ppa:deadsnakes/ppa
2 sudo apt update
3 sudo apt install python3.11
```

Verify installation:

```
1 python3 --version
```

## 2.3 Docker

Required version: **26.1.4**

1. Visit: <https://docs.docker.com/desktop/>
2. Download the installer for your operating system.
3. Run the installer with default settings.

Verify installation:

```
1 docker --version
```

## 2.4 Node.js

Required version: **22.11.0**

1. Download from: <https://nodejs.org>
2. Run the installer with default settings.

Verify installation:

```
1 node --version
2 npm --version
```

## 3 Installation

### 3.1 Clone the Repository

1. Open VS Code.
2. Click “Clone Git Repository” then “Clone from GitHub”.
3. Enter: `https://github.com/COS301-SE-2025/Hands-Up`
4. Choose a folder to save the repository.

### 3.2 Environment Files

Two `.env` files are required:

1. In `backend/api`, create a new file named `.env` with:

Listing 2: Example `.env` file

```
1 DB_NAME=handsup_db
2 DB_USER=postgres
3 DB_PASS=securepassword
4 SMTP_HOST=smtp.gmail.com
5 SMTP_PORT=587
6 SMTP_USER=tmkdt.cos301@gmail.com
7 SMTP_PASS=securepassword
8 SMTP_FROM=tmkdt.cos301@gmail.com
9 FRONTEND_URL=http://localhost:3000
10 NODE_ENV=development
```

2. Repeat in `backend/database` with just the first 3 variables.

### 3.3 Python Libraries

1. Ensure pip is up to date:

```
1 python3 -m pip install --upgrade pip
```

2. Create requirements.txt in the root folder:

```
1 opencv-python
2 mediapipe
3 numpy
4 tensorflow
5 fastapi
6 httpx
7 python-multipart
8 uvicorn
9 torch
10 transformers
```

This will already ensure installation of appropriate versions

3. Install all libraries:

```
1 python3 -m pip install -r requirements.txt
```

The requirements.txt can then be deleted.

### 3.4 Node Packages

Run the following commands in a single terminal

1. API packages:

```
1 cd backend/api
2 npm install
```

2. Frontend packages:

```
1 cd ../../frontend
2 npm install
```

3. Root packages:

```
1 cd ..
2 npm install
```

For version numbers, refer to the package.json files in the appropriate directories.

## 4 Running the Application

1. Run Docker (open the application)
2. Start the Python API in one terminal:

```
1 cd backend/api
2 python3 handsUp.py
```

3. Start the React app in another terminal:

```
1 npm run start
```

```
> handsUP Application@1.0.0 start
> concurrently "npm run database:with-migration" "npm run api" "npm run ui"

[1]
[1] > handsUP Application@1.0.0 api
[1] > cd backend/api && npm i && node handsUp.js
[1]
[0]
[0] > handsUP Application@1.0.0 database:with-migration
[0] > npm run database && sleep 15 && npm run database:migrate
[0]
[2]
[2] > handsUP Application@1.0.0 ui
[2] > cd frontend && npm i && npm start
[2]
[0]
[0] > handsUP Application@1.0.0 database
[0] > cd backend/database && docker-compose up -d --build
[0]
[1]
[1] up to date, audited 89 packages in 2s
[1]
[1] 15 packages are looking for funding
[1]   run `npm fund` for details
[1]
[1] found 0 vulnerabilities
[0] time="2025-08-19T20:30:05+02:00" level=warning msg="C:\\Users\\user\\OneDrive - University of Pretoria\\Final Year\\Semester 2\\COS 301\\Capstone\\Hands-Up\\ba
ckend\\database\\docker-compose.yml: 'version' is obsolete"
[0] Container HandsUp_DB Running
[0] Container flyway_migration Created
[0] Container flyway_migration Starting
[1]
[1] HTTP Server running on http://localhost:2000
[1] API available at http://localhost:2000/handsUPApi
[1] Type "shutdown" to stop the server.
[0] Container flyway_migration Started
```

Figure 1: Terminal output after command

This custom script will run the docker container, node js API server and react app. The application will be available at: <http://localhost:3000>

The user manual can be found via the link in the README of the github repository.