**1. Introduction**

The **YIM Robot** is a voice-controlled, multitasking assistant designed for home automation, classroom navigation, and safety monitoring. It combines offline voice recognition, RFID navigation, and IoT capabilities to perform tasks like object transportation, appliance control, and environmental sensing.

**Key Features**:

* Offline voice commands (no internet required).
* Magnetic tape and RFID-based indoor navigation.
* 3D robotic arm for lightweight object handling.
* Wi-Fi/Bluetooth-enabled home automation.
* Temperature monitoring.

**2. Safety Information**

⚠️ **Warnings**:

* **Do not expose to water** or humid environments.
* **Avoid collisions** with obstacles to prevent sensor damage.
* **Keep fingers/hair away** from robotic arm during operation.
* **Charge the battery** only with the provided 12V adapter.
* **Power off** before cleaning or maintenance.
* **Avoid over load** operation with 3D arm (max. weight 100-150g)
* **Battery protection,** do not drop the lipo battery voltage below 10v.

**3. Setup Instructions**

**3.1 Powering On**

1. Slide the **2A rocker switch** to the "ON" position.



Power ON/OFF Switch

1. The OLED display will show a robotic face animation and the robot will say “**YIM is activated**”.

**3.2 Initial Voice Setup**

1. **Wake-Up Command**: Activate the robot by saying **"Hey YIM"**, **"Hello YIM"**, or simply **"YIM"**. Once awakened, the robot remains in **active listening mode for 1 minute**, allowing you to issue subsequent commands *without* repeating the wake-up phrase.

**4. Operation Guide**

**4.1 Voice Commands**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sl. No. | FUNCTIONS | COMMAND WORD | | REPLY |
|  | To turn OFF the **robot modes,** showing **temperature** and **wink** in the **oled display** say this command words. | turn off the mode, off the mode, mode stop | | all modes turn off |
|  | **Robot modes** | please follow me, follow me, turn follow mode on, follow mode | | follow mode on |
|  | dance for me, show me some moves, dance | | okay i will dance for you |
|  | take three sixty turn, rotate, three sixty degree | | okay, i will do three sixty turning for you |
|  | wink, robot wink | | here you go |
|  | turn alexa mode on, switch to alexa mode | | alexa mode on |
|  | Turn on the magnetic tape following mode, tape following mode on, tape following mode, magnetic tape following mode on | | Okay magnetic tape following mode is on |
|  | Turn off bluetooth mode | | Ok bluetooth mode off |
|  | Turn on bluetooth mode | | Ok bluetooth mode on |
|  | **Navigation rooms** | Thankyou you can go back now, return to your station | | your most welcome, i am returning |
|  | go to electrical class room five, please go to electrical room five | | okay i am going to electrical class room five |
|  | go to electrical class room three, please go to electrical class room three | | okay i am going to electrical class room three |
|  | go to civil class room five, please go to civil room five | | okay i am going to civi class room five |
|  | go to mechanical class room five, please go to mechanical room five | | okay i am going to civil class room three |
|  | go to common room, go to lecturer's common room | | okay i am going to lecturer's common room |
|  | go to charging station, robot charge | | okay i go to charging station |
|  | take this and give to electrical class room five, deliver this to electrical class room five | | okay give me i will deliver it to electrical class room five |
|  | take this and give to electrical class room three, deliver this to electrical class room three | | okay give me i will deliver it to electrical class room three |
|  | take this and give to civil class room five, deliver this to civil class room five | | okay give me i will deliver it to civil class room five |
|  | take this and give to civil class room three, deliver this to civil class room three | | okay give me i will deliver it to civil class room three |
|  | take this and give it to the lecturers common room, deliver this to teachers common room, deliver to common room | | okay give me i will deliver it to lecturer's common room |
|  | **3D arm movements** | unfold your arm, open your arm | | okay |
|  | fold your arm, close your arm | | okay |
|  | open grip, open your hand | | okay |
|  | grip it, hold this, close your hand | | okay |
|  | elbow up | | okay |
|  | elbow down | | okay |
|  | shoulder front | | okay |
|  | shoulder back | | okay |
|  | wrist right, clock | | okay |
|  | wrist left, anti clock | | okay |
|  | Wrist rotate right, right rotate | | okay |
|  | Wrest rotate left, rotate left | | okay |
|  | Base rotate right, shoulder right | | okay |
|  | Base rotate left, shoulder left | | Okay |
|  | hand shake, handskake, give me your hand | | okay, hold my hand |
|  | yim you know what to do, start the task | | okay |
|  | **Home automation & monitoring** | can you please display the temperature, robot what is the room temperature | | temperature is displayed on the oled screen |
|  | switch on the light one, turn on the light one | | okay light one is turning on, light one is on |
|  | switch on the light two, turn on the light two | | okay light two is turning on, light two is on |
|  | turn on the smart t v, switch on the t v, turn on the t v | | smart tv is turned on |
|  | turn on the fan, switch on the fan | | okay i will switch on the fan |
|  | turn off the light one, switch off the light one | | light one is turn off |
|  | turn off the light two, switch off the light two | | light two is turn off |
|  | turn off the smart t v, switch off the t v, turn off the t v | | okay smart class room tv is turning off for you |
|  | turn off the fan, switch off the fan | | okay i will switch off the fan |
|  | **Robot movements** | move forward, move front | | okay |
|  | move backward, move back | | okay |
|  | turn right | | okay |
|  | turn left | | okay |
|  | brake, stop | | okay |
|  | front front | **(This command will move the robot only for some distance so that it can be used to adjust the positioning of the robot)** | okay |
|  | back back | okay |
|  | right right | okay |
|  | left left | okay |
|  | okay, hold my hand | | okay |
|  | **Enquiry commands** | who created you, who made you, who invented you, who design you | | Four Electrical students from 2022 batch: Imliluyim, Thsidishang, Noliba, and Kokhainthong. |
|  | who is your master | | Imliluyim, Thsidishang, Noliba, and Kokhainthong. |
|  | what is the name of your college, name of your institution, you are from which college | | Khelhoshe Polytechnic Atoizu, Zunheboto, Nagaland. |
|  | tell me about your college, can you tell me about k p a, say something about your college, give a short introduction about khelhoshe polytechnic atoizu | | Khelhoshe Polytechnic Atoizu (KPA), set up in nineteen seventy two, is one of the oldest technical institutes in Nagaland. It is in Atoizu, Zunheboto, and offers diplomas in Electrical, Civil, Mechanical, and Automobile Engineering. The college is linked with the State Council for Technical Education and aims to build skills, support innovation, and get students and prepare them for industry and entrepreneurship. |
|  | what do you know about your institution, briefly describe k p a, introduce your college in a few lines, what is k p a known for, tell me something about your polytechnic | | Khelhoshe Polytechnic Atoizu (KPA), set up in nineteen seventy two, is one of the oldest technical institutes in Nagaland. It is in Atoizu, Zunheboto, and offers diplomas in Electrical, Civil, Mechanical, and Automobile Engineering. The college is linked with the State Council for Technical Education and aims to build skills, support innovation, and get students and prepare them for industry and entrepreneurship. |
|  | who is the principal of college, college principal | | Engineer Neisekho Chaya is the Principal of KPA. |
|  | electrical department faculty, can you please tell me the names of the electrical lectures , electronic teacher, electrical teachers name | | Engineer B. Lichamo Murry (HOD), engineer Poushong K. Lam, engineer Yibenthung Odyuo, and engineer Meyachuba. |
|  | tell me the civil lectures name, can you tell me the names of the civil lecturers, civil teacher name | | engineer Nzani A. Murry (HOD), engineer A. Rentsamo Tsope, and engineer Khruvelu. |
|  | tell me the mechanical lectures name, mechanical teachers name, who are the lecturers in the mechanical department, mechanical faculty | | engineer Pavito V. Yepthomi (HOD), engineer Manu Chiero, and sir Takusunep Walling. |
|  | tell me science and humanities lectures name, can you tell me the names of the general lecturers, who are the faculties in the science and humanities department, general teacher | | Miss Jandeno Jami (In-Charge), Miss Melevolu Thisa, sir Lhutu Keyho, engineer Mankup K., Miss Mennyei B. Phom, sir Sungjemliba Longkumer, and sir Kulo Kapfo. |
|  | tell me the automobile teachers name, can you tell me the names of automobile faculties, automible teachers, could you please share the list of automobile faculty | | engineer Ruokuobeilie Mere (HOD) and engineer Jenibemo T. Murry. |
|  | Who is the head of mechanical department, mechanical head of department | | Engineer Ruokuobeilie Mere |
|  | Who is the in charge of science and humanities department, general in charge, head of science department | | Miss Jandeno Jami |
|  | tell me the monday routine, tell me the routine for monday | | First: Entrepreneurship, Second: Elective two, Third: Testing & Maintenance, Fourth: Control System. |
|  | tell me the tuesday routine, tell me the routine for tuesday | | First: Switchgear & Protection, Second: Control System, Third: Elective two, Fourth: Entrepreneurship. |
|  | tell me the wednesday routine, tell me the routine for wednesday | | First: Switchgear and Protection, Second: Entrepreneurship, Eleven fifteen a.m. to one fifteen p.m.: Professional Practice. |
|  | tell me the thursday routine, tell me the routine for thursday | | First: Elective Two, Second: Switchgear & Protection, Third: Testing & Maintenance, Fourth: Off. |
|  | tell me the friday routine, tell me the routine for friday | | First: Testing & Maintenance, Second: Control System, Eleven fifteen a.m. to one fifteen p.m.: Project Work. |
|  | hey robot what is your main objective, can you tell me what you were designed to do, what is your objectives | | I’m an AI voice-controlled multitasking robot built to assist in homes and schools. I navigate, carry items, follow commands, control devices, and aim to inspire interest in AI and robotics. |
|  | robot what features do you have, can you list your main functions | | I use offline voice commands, follow humans using ultrasonic sensors, and carry objects with a three D robotic arm. I navigate using magnetic paths and RFID, avoid obstacles, and control appliances wirelessly. Future upgrades include Alexa integration. |
|  | where can you be used in real life, how are you helpful at home or college, what are the application of this robot | | I help in colleges by carrying items and navigating rooms, and at home by controlling devices, enhancing safety, and responding to voice commands. I can assist in public events, too. |
|  | Who is the Head of Automobile department, head of the department automobile | | Engineer Ruokuobeilie Mere |
|  |  | |  |
|  | yim you know what to do, start the task | | okay |
|  | Who is workshop in charge, workshop Head of department, work shop head of department, practical head of department | | Engineer Narojungla |
|  | Who is the Head of electrical department, electronics head of department, electrical engineering head of department | | Engineer Lichamo Murry |
|  | Who is the Head of civil department, civil head of department, civil engineering head of department | | Engineer Nzani A. Murry |

**4.2 Some eg. of Robotic Arm Usage :**

1. Say **"Hey YIM, unfold your arm"** to unfold the arm.(command no. **22**)
2. Say **"** **handskake "** for hand shake.(command no. **33**),,,, etc

**4.3 Some eg. of Home Automation usage :**

1. The robot will automatically Pair with smart appliances via the ESP32’s Wi-Fi once you turn on the robot so it can control 2 LEDs, 1 fan & 1 TV 6A socket.
2. Use commands like **"Hey YIM, turn on lights 1"** to turn on the lighte one (command no. **39**).

**4.3 Some eg. of Robotic movements Usage :**

1. Say **"Hey YIM, move forward"** to make the robot forward .(command no. **47**)

**5. Troubleshooting**

| **Issue** | **Solution** |
| --- | --- |
| **No response to commands** | Restart the robot by switching off and on, press reset botton, Check battery level, |
| **Navigation errors** | Clean magnetic tape path; ensure RFID tags are visible. |
| **Robotic arm misalignment** | Check the connections wire of the PWM servo driver module. |
| **Human following**  **error** | Realignment the front, left and right ultra sonic sensors as shown in the fig. |
| **Wi-Fi failure** | Restart the robot; ensure devices are in range, press ESP32 reset switch. |

**6. Maintenance**

* **Weekly**: Clean sensors (ultrasonic, IR) with a dry cloth.
* **Monthly**: Recharge the battery fully to prolong lifespan, check rust, lube motor gears and grip , wire connections, tightening screws and nuts.
* **As Needed**: Update firmware via the ESP32’s USB port if needed, disconnect VC-02 from the PCB while uploading the Arduino code.

**7. Technical Specifications**

| **Component** | **Details** |
| --- | --- |
| **Microcontrollers** | 2 - ESP32 (Wi-Fi/Bluetooth), 1-Arduino Uno |
| **Battery** | 12V LiPo, 2200mAh |
| **Sensors** | HC-SR04 (ultrasonic), DHT11 (temperature) |
| **Actuators** | 12V DC gear motors, SG90 servo motors |
| **Voice Module** | VC02 AI Thinker (offline recognition) |

**8. Support**

1. For assistance, contact:  
   📧 **Email**: [syim01167#@gmail.com](mailto:syim01167@gmail.com?subject=YIM%20robot%20assistance)

* **Contact :** 9678134585

**:** 9362572972

🌐 **Website** : <https://kpanagaland.org.in/>

**9. Trial User Manual (Quick Start)**

**1. Power On**: Slide the rocker switch and wait for the OLED to light up.  
**2. Calibrate**: Say **"Hey YIM"** and follow on-screen prompts.  
**3. Basic Commands**:

* **"Hey YIM, follow me"** – Follows you.
* **"Hey YIM, go to electrical room 5"** – Navigates to RFID-tagged locations.
* **"Hey YIM, turn on fan"** – Controls paired appliances.

**10. Need Help?**

Tape the link and video below for video tutorials, components data sheets and user manual :

1. AI Thinker. (n.d.). *VC02 Offline Voice Recognition Module Datasheet*. Retrieved

from [https://www.ai-thinker.com](https://www.ai-thinker.com/)

1. Espressif Systems. (2023). *ESP32 Technical Reference Manual*. Retrieved from [https://www.espressif.com](https://www.espressif.com/)
2. Arduino. (n.d.). *Arduino Uno Rev3 Documentation*. Retrieved from[https://docs.arduino.cc](https://docs.arduino.cc/)
3. Amazon Robotics. (2023). *Astro Home Robot: Technical Overview*. Retrieved from [https://developer.amazon.com](https://developer.amazon.com/)
4. MFRC522 RFID Reader Datasheet. (n.d.). NXP Semiconductors. Retrieved from [https://www.nxp.com](https://www.nxp.com/)
5. Tinkercad Circuits. (n.d.). *Simulation Platform for Embedded Systems*. Autodesk. Retrieved from [https://www.tinkercad.com](https://www.tinkercad.com/)
6. DHT11 Sensor Datasheet. (n.d.). Aosong Electronics. Retrieved from [https://www.aosong.com](https://www.aosong.com/)
7. Youtube tutorial for :

VC-02 UART communication [Connecting VC02 with external Microcontroller via UART | VC02 Offline Voice Recognition board](https://www.youtube.com/embed/P0UDOAZBqr4?feature=oembed) https://www.youtube.com/watch?v=P0UDOAZBqr4&t=1s

VC-02 frame ware build [Add Custom Voice Control to any Project using this Module without Internet | VC02 Module](https://www.youtube.com/embed/dAqX4CmozfM?feature=oembed) https://www.youtube.com/watch?v=dAqX4CmozfM&t=8s