JARVIS AI Voice Assistant - Complete Documentation

Overview

JARVIS is an advanced AI-powered voice assistant designed for Windows systems. It integrates Mistral AI, speech recognition, and various APIs to provide a comprehensive assistant experience with both voice and GUI interactions.

Installation Guide

System Requirements

- **Operating System**: Windows 10 or higher
- **Python Version**: Python 3.7 or higher
- **Microphone**: Physical microphone recommended
- **Camera**: Optional (for visual features)
- **Audio Output**: Speakers or headphones

Step 1: Install Python

Download and install Python from https://www.python.org/

Ensure "Add Python to PATH" is checked during installation.

Step 2: Install Required Libraries

Open PowerShell or Command Prompt and run:

pip install pyaudio numpy pyttsx3 SpeechRecognition wikipedia pyautogui spotipy psutil requests speedtest-cli Pillow pyperclip opencv-python customtkinter gtts playsound3 wolframalpha screenbrightnesscontrol pywhatkit paho-mqtt plyer

Step 3: Additional Dependencies

For Mistral AI Integration:
pip install mistralai

Optional Packages:
pip install deeptranslator beautifulsoup4 imaplib

Step 4: System Dependencies

For **Windows**, ensure PortAudio is installed:

- Download from https://www.portaudio.com/
- Or use pre-built wheels for pyaudio

Step 5: API Keys Configuration

Create a .env file or modify the script with your API keys:

- **Mistral AI API Key**: MISTRAL_API_KEY = "your_key_here"
- **Weather API Key**: WEATHER_API_KEY = "4798411523696fd8d7a2378fc79ff3d3"
- **News API Key**: NEWS_API_KEY = "532717587a1f48be94b477be2fd5ed96"
- **WolframAlpha ID**: WOLFRAM_APP_ID = "PLJPG925HP"
- **ImgBB API Key**: IMGBB_API_KEY = "3cc18ba1d0f961826d1184bea0936824"
- **Spotify Credentials**:
  - Client ID: SPOTIFY_CLIENT_ID
  - Client Secret: SPOTIFY_CLIENT_SECRET

Step 6: Gmail Configuration (for Email Features)

1. Enable 2-factor authentication on your Gmail account
2. Generate an App Password: https://myaccount.google.com/apppasswords
3. Update credentials in the script:
   - EMAIL = "your_email@gmail.com"
   - PASSWORD = "your_app_password"

Complete Command List

Web & Search Commands

Command	Function
"Open [website]"	Open website in browser (e.g., "open youtube.com")
"Search Google for [query]"	Search on Google
"Search YouTube for [query]"	Search and play on YouTube

Media Controls

Command	Function
"Play [song name]"	Play song on Spotify or YouTube
"Play music"	Play current Spotify playlist
"Pause"	Pause media
"Next"	Play next track
"Previous"	Play previous track
"Volume up"	Increase volume
"Volume down"	Decrease volume
"Set volume to [level]"	Set volume to specific level (0-100)
"Mute volume"	Mute audio

Weather & News

Command	Function
"What is the weather in [city]?"	Get weather information
"Read news"	Read latest news headlines
"Get news in [category]"	Get news by category (business, technology, sports, entertainment, health, science)

System Control

Command	Function
"Lock system"	Lock Windows workstation
"Shutdown"	Shut down computer (10 second delay)
"System info"	Display CPU, memory, and disk usage
"Battery status"	Check battery percentage and charging status
"Screenshot"	Take and save screenshot
"Open [application]"	Open installed application (e.g., "open notepad")
"Close app [name]"	Close running application
"Set brightness to [level]"	Set screen brightness (0-100)

File & Folder Management

Command	Function
"Create folder [name]"	Create new folder
"Create note"	Create text note (interactive)
"Add to to-do"	Add task to to-do list
"Read to-do list"	Display all to-do items
"Read file [filename]"	Read text file content
"Write to file [filename]"	Write content to file
"Search files"	Search for files by name
"Delete temporary"	Clear temporary files

Time & Alarms

Command	Function
"What time is it?"	Display current time
"What date is it?"	Display current date
"Set alarm for [time]"	Set alarm (e.g., "7:30 PM" or "19:30")
"Set timer for [duration]"	Set countdown timer (e.g., "10 seconds")
"Start stopwatch"	Start stopwatch
"Stop stopwatch"	Stop stopwatch and display elapsed time

Communication

Command	Function
"Send WhatsApp message"	Send WhatsApp message (interactive)
"Read my email"	Read latest unread email
"Read latest email"	Fetch and read most recent email
"Send email"	Send email (interactive)

Image & Visual Features

Command	Function
"Take a photo"	Capture image from webcam
"Click my photo"	Open Camera app and take photo
"Describe what you see"	Capture and analyze image with AI
"Visual search"	Capture image for visual analysis
"Generate image of [description]"	Generate image using Seedream API

Math & Conversions

Command	Function
"Calculate [expression]"	Solve math problems (e.g., "calculate 15 plus 27")
"What is [expression]?"	Ask mathematical questions
"Convert [value] [unit] to [unit]"	Unit conversion (inches↔cm, Celsius↔Fahrenheit)

Productivity & Notes

Command	Function
"Create note"	Create a new note
"Create to-do"	Add item to to-do list
"Remind me to [task]"	Set reminder
"Save chat"	Save conversation to file

Smart Home Control

Command	Function
"Turn on light"	Turn on living room light (MQTT)
"Turn off light"	Turn off living room light (MQTT)

Entertainment

Command	Function
"Tell me a joke"	Get random joke
"Play quiz"	Play interactive 5-question quiz
"Read Wikipedia about [topic]"	Search and read Wikipedia summary

Desktop Automation

Command	Function
"Move mouse to [x] [y]"	Move mouse cursor to coordinates
"Click mouse"	Click mouse
"Type [text]"	Type text on screen
"Press [key]"	Press keyboard key

General Interaction

Command	Function
"How are you?"	Casual greeting response
"Call me [name]"	Change assistant's address
"Hello"	Greeting response
"Sleep"	Enter sleep mode (say "wake up" to activate)
"Wake up"	Exit sleep mode
"Chat with me" / "Let's talk"	Start conversation mode
"Ask AI [question]"	Ask Mistral AI questions
"What should I ask?"	Open AI chat mode

Advanced Features

Command	Function
"Check internet speed"	Run internet speed test
"Generate password"	Create and copy random password
"Start screen recording"	Record screen (10 seconds default or custom duration)
"Stop screen recording"	Stop active screen recording
"Translate [text] to [language]"	Translate text to another language

Internet & Connectivity

Command	Function
"Check internet speed"	Speedtest for download/upload/ping
"Internet speed"	Run speed test
"Speed test"	Full internet connectivity test

IPL & Cricket (if integrated)

Command	Function
"IPL score"	Get latest IPL cricket scores

Core Libraries & Their Functions

Speech & Audio

- **pyttsx3**: Text-to-speech engine (creates voice output)
- **SpeechRecognition**: Convert speech to text
- **pyaudio**: Audio input/output management
- **gtts**: Google Text-to-Speech (alternative TTS)
- **playsound**: Play audio files

AI & Language

- **mistralai**: Mistral AI API for intent detection and chat
- **wolframalpha**: Mathematical and computational queries
- **wikipedia**: Wikipedia content retrieval
- **deeptranslator**: Language translation

Web & APIs

- **requests**: HTTP requests for API calls
- **spotipy**: Spotify API integration
- **pywhatkit**: WhatsApp automation
- **beautifulsoup4**: Web scraping

System & Hardware

- **pyautogui**: Keyboard and mouse control
- **psutil**: System monitoring (CPU, memory, disk, battery)
- **cv2 (OpenCV)**: Webcam capture and image processing
- **PIL (Pillow)**: Image manipulation and screenshots
- **screenbrightnesscontrol**: Display brightness control

GUI & Interface

- **tkinter**: GUI framework (dialogs, windows)
- **customtkinter**: Modern dark-mode GUI
- **simpledialog**: Input dialogs

Utilities

- **numpy**: Numerical computing
- **pyperclip**: Clipboard manipulation
- **speedtest-cli**: Internet speed testing
- **paho-mqtt**: Smart home IoT control
- **plyer**: System notifications
- **imaplib**: Gmail IMAP access

Configuration Files

Required Environment Variables or Settings

Create settings in the script or .env file:

MISTRAL_API_KEY = "your_mistral_key"
WEATHER_API_KEY = "your_weather_key"
NEWS_API_KEY = "your_news_api_key"
WOLFRAM_APP_ID = "your_wolfram_id"
IMGBB_API_KEY = "your_imgbb_key"
SPOTIFY_CLIENT_ID = "your_spotify_id"
SPOTIFY_CLIENT_SECRET = "your_spotify_secret"
EMAIL = "your_email@gmail.com"
PASSWORD = "your_app_password"
JARVIS_PASSWORD = "1234" # Access code
USERNAME = "Sir" # Default assistant address

Default Folders & Files

- **JarvisNotes/**: Folder for storing notes
- **todo.txt**: To-do list file
- **reminders.txt**: Reminders file
- **chatlog.txt**: Chat history log
- **jarviserrors.log**: Error log file

Running the Assistant

Method 1: Direct Python Execution

python jarvis.py

Method 2: PyInstaller Executable

To create a standalone Windows .exe:

pip install pyinstaller
pyinstaller --onefile --windowed jarvis.py

The executable will be in the dist/ folder.

Method 3: Run on Startup

The assistant can auto-start by creating a batch file in Windows startup folder:

echo off
python C:\path\to\jarvis.py

Troubleshooting

Microphone Issues

- **Virtual microphone detected**: Use physical microphone or adjust audio input settings
- **No audio input**: Check Windows audio settings and run audio troubleshooter
- **Command: "Check microphones"** - Lists available microphones

API Key Errors

- Verify API keys are correctly set and have quota remaining
- Check internet connection
- Update API keys if they expire

Mistral AI Errors

- Ensure valid API key with active credits
- Check internet connectivity
- Verify request format (JSON)

Spotify Not Playing

- Ensure Spotify is installed and logged in
- Open Spotify desktop app on same device
- Verify Spotify API credentials

Email Read Issues

- Enable 2-factor authentication on Gmail
- Generate and use App Password (not regular password)
- Allow IMAP access in Gmail settings

Speech Recognition Timeout

- Ensure clear audio input
- Increase timeout duration in code if needed
- Check microphone is properly connected

Advanced Configuration

Customize Voice Parameters

engine = pyttsx3.init()
engine.setProperty('rate', 180) # Speed (0-300)
engine.setProperty('volume', 0.9) # Volume (0-1)

Modify Intent Categories

Edit the detect_intent() function to add custom intents:

"custom_intent": "your_custom_command",

Add Custom Commands

In handle_command(), add new conditional blocks:

if "your_command" in query:
# Your custom logic here
speak("Response text")
return

Security Notes

- **Never hardcode API keys** in public repositories; use environment variables
- **Gmail App Password**: Use App Password instead of main password
- **Startup batch file**: Only add if assistant is intended for personal use
- **Audio Recording**: Ensure privacy settings are configured
- **Microphone Permissions**: Grant necessary Windows permissions

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Tips & Best Practices

1. **Microphone Calibration**: The assistant calibrates for ambient noise on startup
2. **Sleep Mode**: Use sleep mode to save resources when not in use
3. **Chat History**: Check chatlog.txt for conversation logs
4. **Error Logs**: Check jarviserrors.log if issues occur
5. **Theme Toggle**: Switch between light and dark mode in GUI
6. **Authentication**: Set secure access code in configuration
7. **Command Variants**: Most commands accept multiple phrasings

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Future Enhancement Ideas

- Add calendar integration
- Implement task scheduling
- Expand language support
- Add custom voice commands
- Integrate more smart home devices
- Cloud backup for notes
- Advanced analytics dashboard

Support & Resources

- **Mistral AI Docs**: https://docs.mistral.ai/
- **SpeechRecognition**: https://github.com/Uberi/speech_recognition
- **Spotipy**: https://spotipy.readthedocs.io/
- **OpenWeatherMap**: https://openweathermap.org/api

License & Credits

This assistant was built using open-source libraries and APIs. Ensure compliance with each library's license terms when distributing or modifying.

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