# UltronSysAgent 🤖

**Fully Autonomous AI Voice Assistant for Windows 11**

UltronSysAgent is a comprehensive, always-listening AI assistant designed specifically for Windows 11 systems with advanced capabilities including voice interaction, system automation, file processing, and extensible plugin architecture.

## 🌟 Features

### 🎙️ Voice Interface

* **Always-listening** voice activation (no wake word required)
* **Real-time STT** using Whisper or DeepSeek
* **Streaming TTS** with pyttsx3 or ElevenLabs integration
* **Voice Activity Detection** for natural conversation flow

### 🧠 AI Brain

* **Multi-model routing**: OpenAI GPT-4, DeepSeek, or local Phi-3 Mini
* **Intelligent fallback** system with automatic model switching
* **Contextual memory** with short-term and long-term storage
* **Streaming responses** for real-time interaction

### ⚙️ System Automation

* **Full admin access** for system-level operations
* **File operations**: Create, copy, move, delete with safety checks
* **Registry editing** and Windows service management
* **Process control** and network operations
* **Security auditing** with comprehensive command logging

### 🖥️ GUI Interface

* **Ultron-themed** dark interface with crimson accents
* **Real-time chat log** with voice and text input
* **File drop zone** for document processing
* **System monitoring** with CPU/RAM display
* **Admin mode toggle** with security controls

### 📁 File Processing

* **Document extraction**: PDF, DOCX, TXT, JSON, CSV
* **OCR capabilities** for image text extraction
* **File indexing** for quick search and retrieval
* **Drag-and-drop** file processing

### 👁️ Vision System

* **Camera integration** with OpenCV
* **Real-time image analysis** and face detection
* **Screenshot capture** and screen automation
* **OCR processing** for visual text extraction

### 🔧 Extensibility

* **Plugin system** for custom tool development
* **Event-driven architecture** with pub/sub messaging
* **Memory integration** for knowledge persistence
* **Custom command mapping** and automation workflows

### 🛡️ Security & Safety

* **Admin mode protection** for dangerous operations
* **Command confirmation** for destructive actions
* **Comprehensive logging** for security auditing
* **Offline mode** support for privacy protection

## 🚀 Quick Start

### Prerequisites

* **Windows 11** (MSI Thin 15 B13UC or compatible)
* **Python 3.10+**
* **NVIDIA RTX 3050** (for GPU acceleration)
* **Admin privileges** (for full functionality)

### Installation

1. **Clone the repository**:

git clone https://github.com/your-repo/UltronSysAgent.git  
cd UltronSysAgent

1. **Run the setup script** (as Administrator):

python scripts/setup\_windows.py

1. **Configure API keys** in config/.env:

OPENAI\_API\_KEY=your\_openai\_key\_here  
DEEPSEEK\_API\_KEY=your\_deepseek\_key\_here  
ELEVENLABS\_API\_KEY=your\_elevenlabs\_key\_here

1. **Start UltronSysAgent**:

python main.py

### Manual Installation

If you prefer manual setup:

# Install dependencies  
pip install -r requirements.txt  
  
# Create directories  
mkdir -p logs data/{memory,cache,models} plugins  
  
# Copy and edit configuration  
cp config/config.json config/config.local.json  
# Edit config.local.json with your preferences  
  
# Run UltronSysAgent  
python main.py

## 📖 Usage Guide

### Voice Commands

UltronSysAgent responds to natural language commands:

"Create a file called test.txt with hello world"  
"Show me system information"  
"Take a screenshot"  
"Search for PDF files containing 'report'"  
"Schedule a reminder for 2 PM today"  
"What's my CPU usage?"

### GUI Controls

* **Mute Button**: Toggle voice listening on/off
* **Admin Mode**: Enable/disable administrative privileges
* **File Drop Zone**: Drag files for automatic processing
* **Chat Log**: View conversation history and system responses

### Configuration

Edit config/config.json to customize:

{  
 "voice": {  
 "always\_listening": true,  
 "stt\_provider": "whisper",  
 "tts\_provider": "pyttsx3"  
 },  
 "ai": {  
 "primary\_model": "gpt-4",  
 "temperature": 0.7  
 },  
 "security": {  
 "require\_admin\_confirmation": true,  
 "log\_all\_commands": true  
 }  
}

## 🔌 Plugin Development

Create custom plugins by adding files to the plugins/ directory:

# plugins/my\_plugin.py  
class MyPlugin:  
 def \_\_init\_\_(self, config, event\_bus):  
 self.config = config  
 self.event\_bus = event\_bus  
   
 async def handle\_command(self, command):  
 # Your plugin logic here  
 return "Plugin response"

## 🏗️ Architecture

### Core Components

* **Application**: Main orchestrator and lifecycle management
* **EventBus**: Pub/sub messaging between modules
* **ConfigManager**: Centralized configuration handling
* **Logger**: Multi-level logging with security auditing

### Modules

* **VoiceEngine**: STT/TTS processing and audio I/O
* **AIBrain**: Model routing and conversation management
* **SystemAutomation**: Windows system control and automation
* **MemoryManager**: Short/long-term memory with vector search
* **FileManager**: Document processing and file operations
* **VisionSystem**: Camera and image processing
* **Scheduler**: Task scheduling and automation

### Data Flow

Voice Input → STT → AI Brain → Response Generation → TTS → Audio Output  
 ↓ ↓ ↓  
File Drop → Processing → Memory Storage → Context Retrieval  
 ↓ ↓ ↓  
System Commands → Validation → Execution → Logging

## 🛠️ Development

### Project Structure

UltronSysAgent/  
├── main.py # Entry point  
├── src/  
│ ├── core/ # Core system components  
│ ├── modules/ # Feature modules  
│ └── gui/ # User interface  
├── config/ # Configuration files  
├── plugins/ # Plugin directory  
├── scripts/ # Setup and utility scripts  
├── data/ # Runtime data storage  
├── logs/ # Application logs  
└── assets/ # Static assets

### Running Tests

# Run unit tests  
python -m pytest tests/  
  
# Run with coverage  
python -m pytest --cov=src tests/

### Code Formatting

# Format code  
black src/  
isort src/  
  
# Type checking  
mypy src/

## 🔧 Troubleshooting

### Common Issues

**Voice not working**: - Check microphone permissions - Verify sounddevice installation - Test audio devices: python -c "import sounddevice; print(sounddevice.query\_devices())"

**AI models not responding**: - Verify API keys in .env file - Check internet connection (unless in offline mode) - Review logs in logs/ultron\_agent.log

**Admin features not working**: - Ensure running as Administrator - Check admin\_mode setting in configuration - Review security logs in logs/commands.log

**GPU acceleration not working**: - Install CUDA toolkit - Verify PyTorch GPU support: python -c "import torch; print(torch.cuda.is\_available())"

### Log Files

* **Main Log**: logs/ultron\_agent.log
* **Error Log**: logs/errors.log
* **Command Log**: logs/commands.log
* **Voice Activity**: logs/voice\_activity.log

## 🤝 Contributing

We welcome contributions! Please see <CONTRIBUTING.md> for guidelines.

### Development Setup

# Clone and setup development environment  
git clone https://github.com/your-repo/UltronSysAgent.git  
cd UltronSysAgent  
  
# Install development dependencies  
pip install -r requirements.txt  
pip install -r requirements-dev.txt  
  
# Setup pre-commit hooks  
pre-commit install

## 📄 License

This project is licensed under the MIT License - see the <LICENSE> file for details.

## 🙏 Acknowledgments

* **OpenAI** for GPT models and Whisper
* **Microsoft** for Windows integration APIs
* **OpenCV** community for computer vision tools
* **Python** ecosystem for foundational libraries

## ⚡ Performance Notes

### Recommended System Requirements

* **CPU**: Intel i5-12500H or equivalent
* **RAM**: 16GB+ (32GB recommended for local models)
* **GPU**: NVIDIA RTX 3050+ with 4GB+ VRAM
* **Storage**: 10GB+ free space for models and data

### Optimization Tips

* Use **GPU acceleration** for local model inference
* Enable **memory caching** for frequently accessed data
* Configure **voice activity detection** threshold for your environment
* Use **offline mode** when privacy is critical

## 📞 Support

* **Issues**: [GitHub Issues](https://github.com/your-repo/UltronSysAgent/issues)
* **Discussions**: [GitHub Discussions](https://github.com/your-repo/UltronSysAgent/discussions)
* **Documentation**: [Wiki](https://github.com/your-repo/UltronSysAgent/wiki)

**UltronSysAgent** - Your intelligent, autonomous AI assistant for Windows 11 🤖✨