

# **Brain Tumor Diagnosis System Using Vision Transformers**

## **User Guide**

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# Preface

Welcome to the user guide for the Brain Tumor Diagnosis System. This document is intended to walk healthcare professionals through each aspect of the application's functionality, from accessing patient records and completing risk-factor assessments to uploading MRI scans and interpreting AI-generated results. You will find detailed instructions for navigating the secure login process, managing patient profiles, recording medical and genetic test data, and generating comprehensive diagnostic reports. Each section includes practical tips and best-practice recommendations to integrate the system seamlessly into your clinical workflow and make the most of its features. If you have questions or encounter challenges, please refer to the FAQ section or consult the support sections for guidance.

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# 1. General Information

The system combines secure patient record management with advanced MRI classification using a pre-trained Vision Transformer model. It provides rapid diagnostic support via a web interface.

## 2. System Summary

- **Purpose:** Classify brain tumors with ML and assist clinicians in patient management.
- **Features:** Secure login, modular patient interface, MRI upload and classification, and comprehensive report generation.
- **Tech Stack:** Flask (frontend), PyTorch (backend), in-memory storage (demo version).

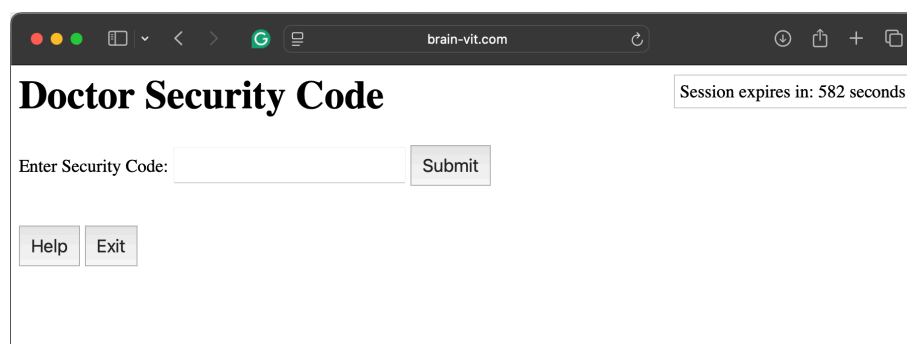
## 3. Getting Started

- **Software:** Python 3.x, Flask, PyTorch, Pillow, vit-pytorch
- **Hardware:** Modern computer and web browser
- **Installation:** The app is hosted on an AWS server and be accessed by opening in any internet browser <https://brain-vit.com>.

## 4. Using the System

### 4.1 Login and Patient Management

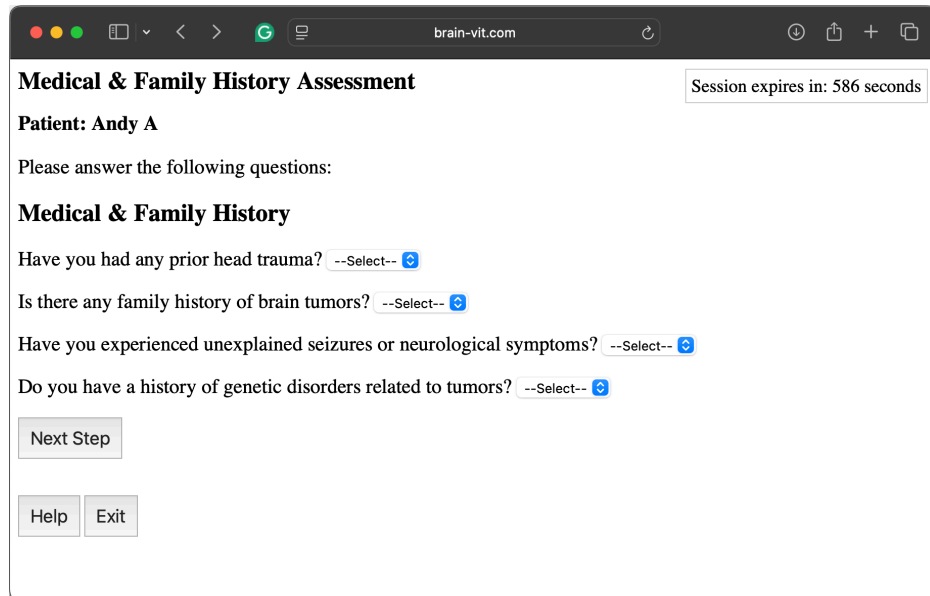
- Enter the security code or practitioner employee ID. This code is currently set to “1234”.
- Add or search for a patient using the dashboard



The screenshot shows a web browser window with the address bar displaying "brain-vit.com". The page title is "Doctor Security Code". In the top right corner, a message states "Session expires in: 582 seconds". The main form contains a label "Enter Security Code:" followed by a text input field and a "Submit" button. At the bottom left of the form, there are two buttons labeled "Help" and "Exit".

## 4.2 Medical History & Testing

- Complete questionnaire
- Enter genetic and lab test results when prompted



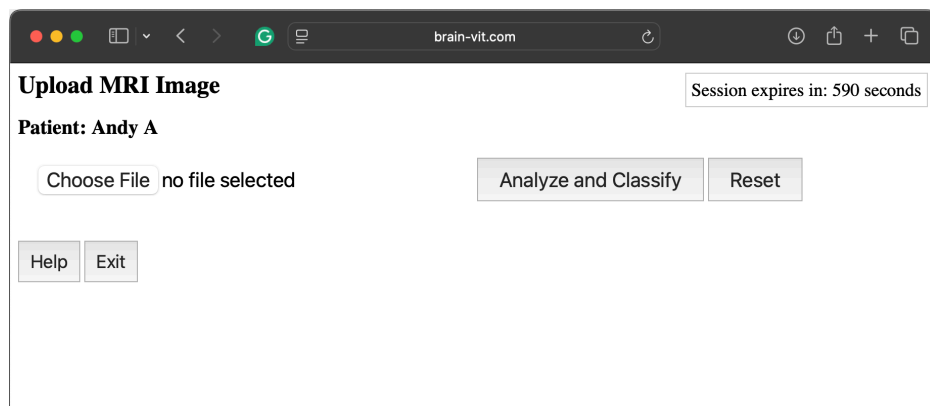
The screenshot shows a web browser window with the URL `brain-vit.com`. The page title is "Medical & Family History Assessment". In the top right corner, a timer indicates "Session expires in: 586 seconds". Below the title, the patient is identified as "Patient: Andy A". A prompt asks the user to "Please answer the following questions:". The section is titled "Medical & Family History" and contains four questions, each with a dropdown menu labeled "--Select--":

- Have you had any prior head trauma?
- Is there any family history of brain tumors?
- Have you experienced unexplained seizures or neurological symptoms?
- Do you have a history of genetic disorders related to tumors?

At the bottom of the form, there are three buttons: "Next Step", "Help", and "Exit".

## 4.3 MRI Upload & Classification

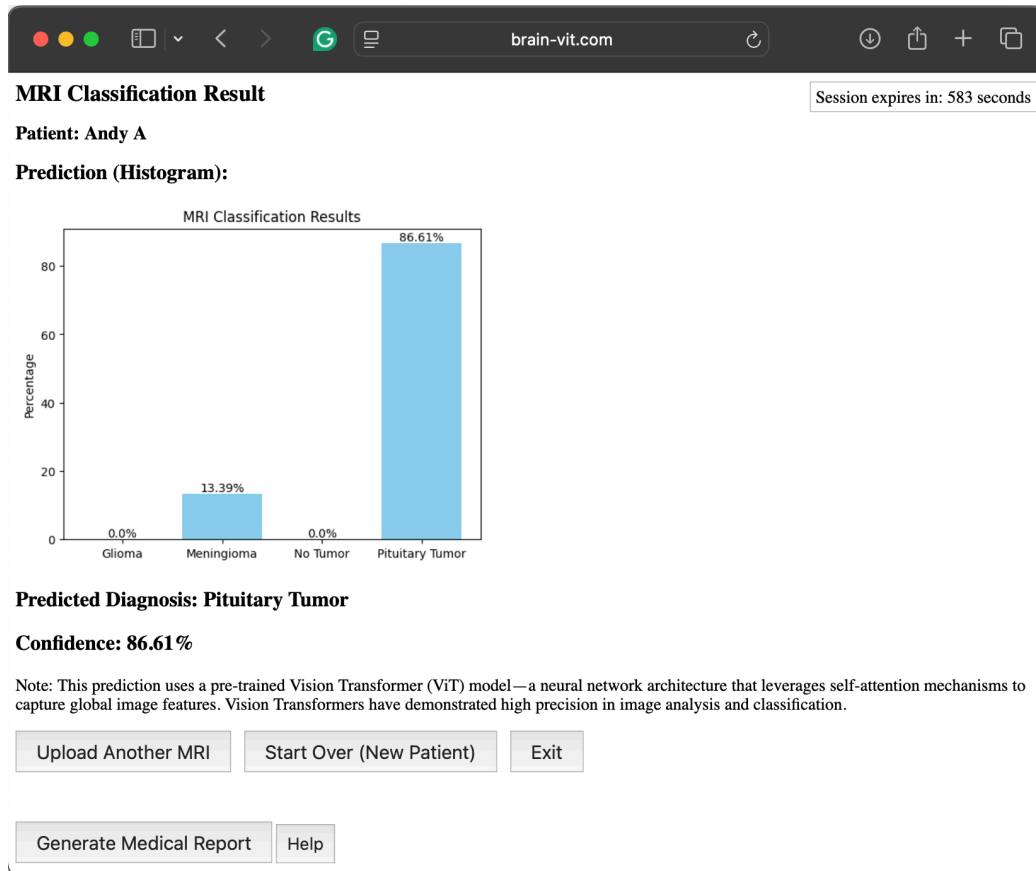
- Navigate to MRI upload
- Upload the MRI as a PNG image



The screenshot shows a web browser window with the URL `brain-vit.com`. The page title is "Upload MRI Image". In the top right corner, a timer indicates "Session expires in: 590 seconds". Below the title, the patient is identified as "Patient: Andy A". The form includes a file upload section with a button labeled "Choose File" and the text "no file selected". To the right of this section are two buttons: "Analyze and Classify" and "Reset". At the bottom of the form, there are two buttons: "Help" and "Exit".

## 4.4 Report Generation

- View classification with confidence levels and the system's suggested diagnosis
- Generate and download a report summarizing all session data



## 5. Troubleshooting

- Check library installation and file placement
- Confirm image format
- Refer to system prompts or contact support

## 6. FAQ

1. **What code is required for login?**  
The default security code is 1234.

2. **Which image format should be used?**  
PNG is recommended for best compatibility.
3. **Can I edit a patient record?**  
Not in the current in-memory setup.
4. **Can the current security code be changed?**  
Yes. The code “1234” is for demonstration purposes. In a production environment, use an alphanumeric password with special characters.
5. **Can I change this code myself?**  
No. In this version of the application, you must contact the developers to modify the security code.
6. **How do I download the medical report?**  
After classification, click **Generate Medical Report**. An HTML file will be downloaded, which you can open in any web browser.
7. **What do the colored highlights in test results indicate?**  
Abnormal values are shown in red; normal values are shown in green.
8. **What happens if my session times out?**  
After 10 minutes of inactivity, you will be automatically logged out and must log in again.

## 7. Help and Support Information

- **Email:** inversionesandy2014@gmail.com
- **Phone:** (xxx) 123-4567
- **Help Button:** Available on all screens

## 8. Glossary

- **ViT:** Vision Transformer, a deep learning model
- **Flask:** A lightweight web framework for Python
- **PyTorch:** A deep learning framework
- **Softmax:** A function that converts model outputs into probabilities