



# FlowLab: Simplifying AI & Medical Imaging for All

A no-code platform empowering students and researchers with accessible machine learning and image analysis

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# Streamlining Machine Learning with FlowLab

Simplify complex workflows and medical image analysis without coding



**No-code platform enabling users to build ML workflows without programming**



**Direct upload of datasets and DICOM medical images via browser**



**Automated preprocessing tools for data and image preparation**



**Support for both supervised and unsupervised learning methods**



**Interactive visualization of models and analysis results**



**AI-powered automation that reduces technical barriers and accelerates workflows**

# Breaking Barriers in AI Medical Imaging

Simplifying access with no-code, browser-based tools



**Complex programming and software installation** limit accessibility for beginners in AI medical imaging.



Manual data preprocessing and complex parameter tuning demand advanced technical skills.



Specialized medical formats like **DICOM** add extra complexity for image analysis.



These barriers discourage students and researchers unfamiliar with coding.



**FlowLab offers a fully browser-based, no-code environment** to eliminate technical barriers.



Users focus on deriving AI insights without needing programming expertise.



**AI Insight:** Lowering technical barriers accelerates AI democratization and fosters faster innovation.

# FlowLab's Core Objectives

Simplifying AI and Medical Imaging Workflows for All Users

Provide a **no-code platform** that simplifies complete machine learning workflows



Automate **data preprocessing** and visualize key metrics to enhance understanding



Support both **supervised and unsupervised machine learning algorithms**



Enable enhancement and analysis of medical images in **DICOM format**



Make AI and medical imaging technology accessible to beginners and researchers, promoting faster experimentation without programming overhead





# FlowLab System Architecture

Modular design enabling scalable, flexible AI and medical imaging workflows

## User Interface

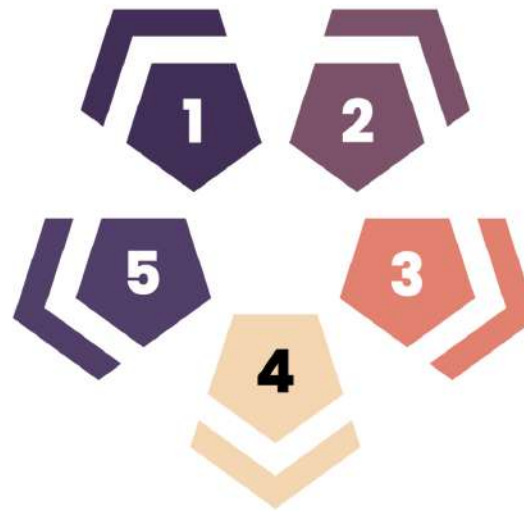
Facilitates intuitive interaction with FlowLab's system for users across data science and medical imaging.

## Visualization & Export Module

Displays analytical results clearly and provides options to share or export findings efficiently.

## DICOM Image Processing Unit

Specializes in enhancement and preparation of medical images using DICOM standards for accurate analysis.



## Data Preprocessing Module

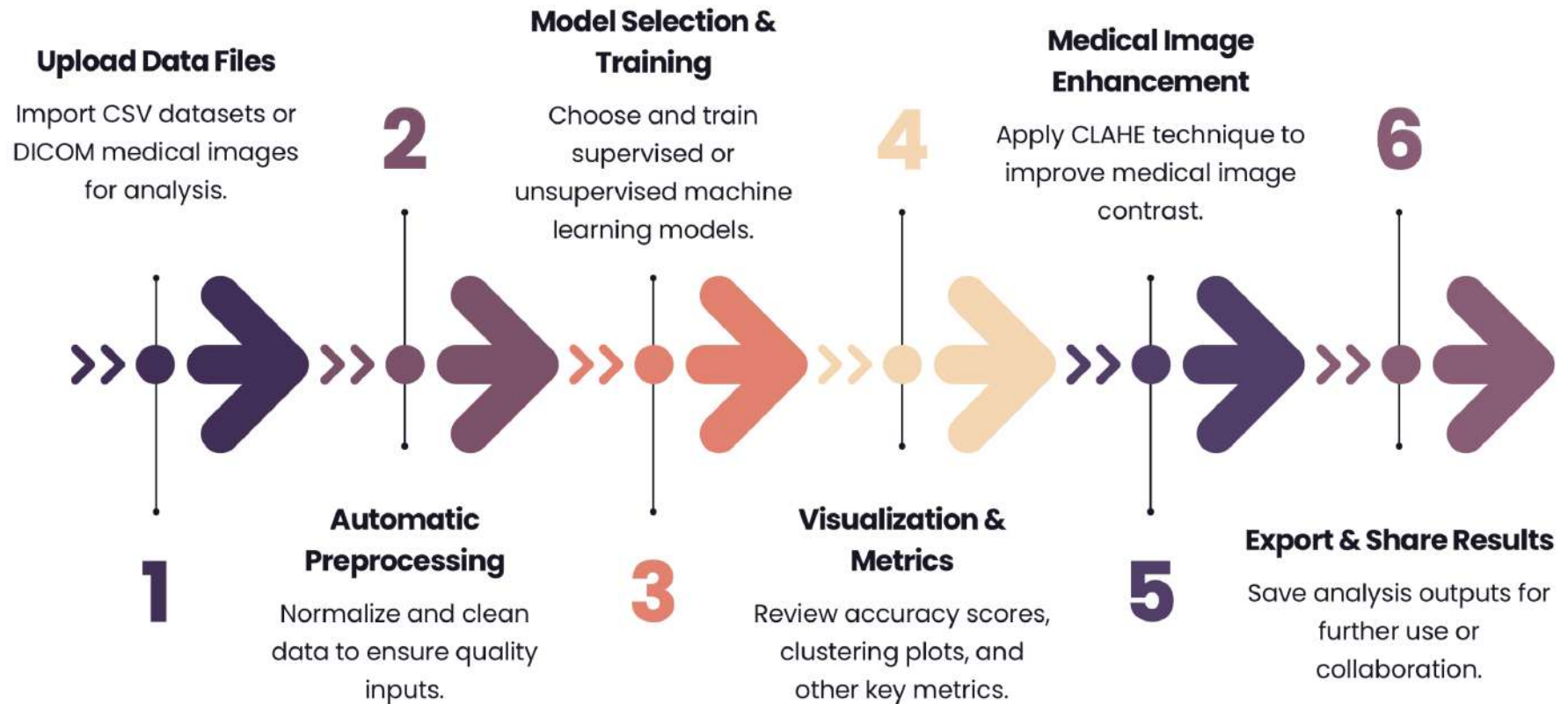
Automates cleaning and transformation of raw data, ensuring quality input for downstream AI processes.

## Machine Learning Engine

Supports training, evaluation, and deployment of machine learning algorithms for predictive modeling.

# FlowLab User Workflow: From Data to Insight

Streamlining AI Experimentation for Accessible Data Science



# Machine Learning Algorithms Empowering FlowLab

Diverse Models for Versatile and Explainable AI Solutions



## **Supervised Learning:**

Logistic Regression, Support Vector Machines (SVM), Random Forest, Decision Tree, K-Nearest Neighbors (KNN)



## **Unsupervised Learning:** K-Means Clustering, DBSCAN



## **Medical Imaging Enhancement:**

**CLAHE** (Contrast Limited Adaptive Histogram Equalization) Improves MRI And Medical Image Quality



AI Insight: Interpretable Algorithms Like Decision Trees And Logistic Regression Aid Beginners In Understanding Model Behavior, Fostering Learning In No-Code Environments.

# Visualizing FlowLab: Key Interfaces & Results

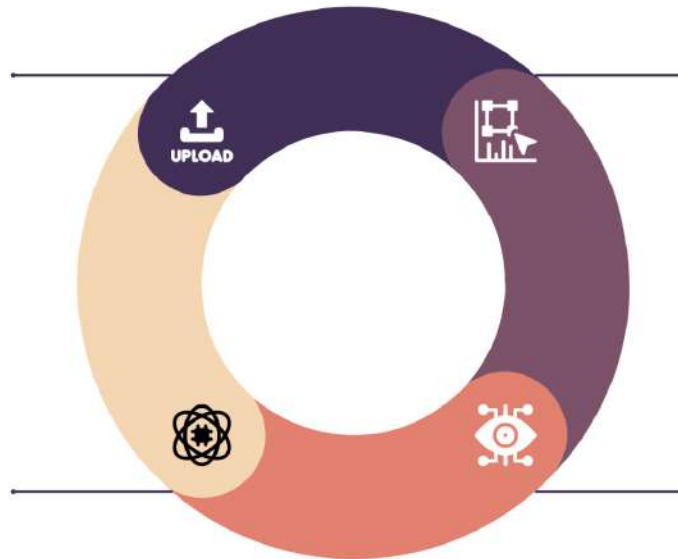
Explore how FlowLab's intuitive visuals simplify complex medical AI workflows and enhance explainability.

## Data Upload & Preprocessing

Streamlined interface enabling efficient data import and preprocessing with clear progress indicators and user-friendly controls.

## AI Visualization Benefits

Clear visual feedback builds user confidence and supports explainability in sensitive medical AI applications, fostering trust and engagement.



## Model Training & Visualization Metrics

Dynamic metrics visualization displaying training progress, accuracy, and loss graphs in an accessible format for improved model interpretability.

## Medical Image Enhancement Results

Side-by-side visual comparison of original versus enhanced images demonstrating FlowLab's powerful medical image processing capabilities.



# Implementation & Tools Driving FlowLab

Core technologies powering data manipulation, ML, visualization, and user interface



Python 3.9 as the primary programming language



Pandas and NumPy for efficient data manipulation



Scikit-Learn enabling machine learning algorithm implementation



Plotly for dynamic, interactive data visualization



OpenCV and pydicom for specialized medical image processing



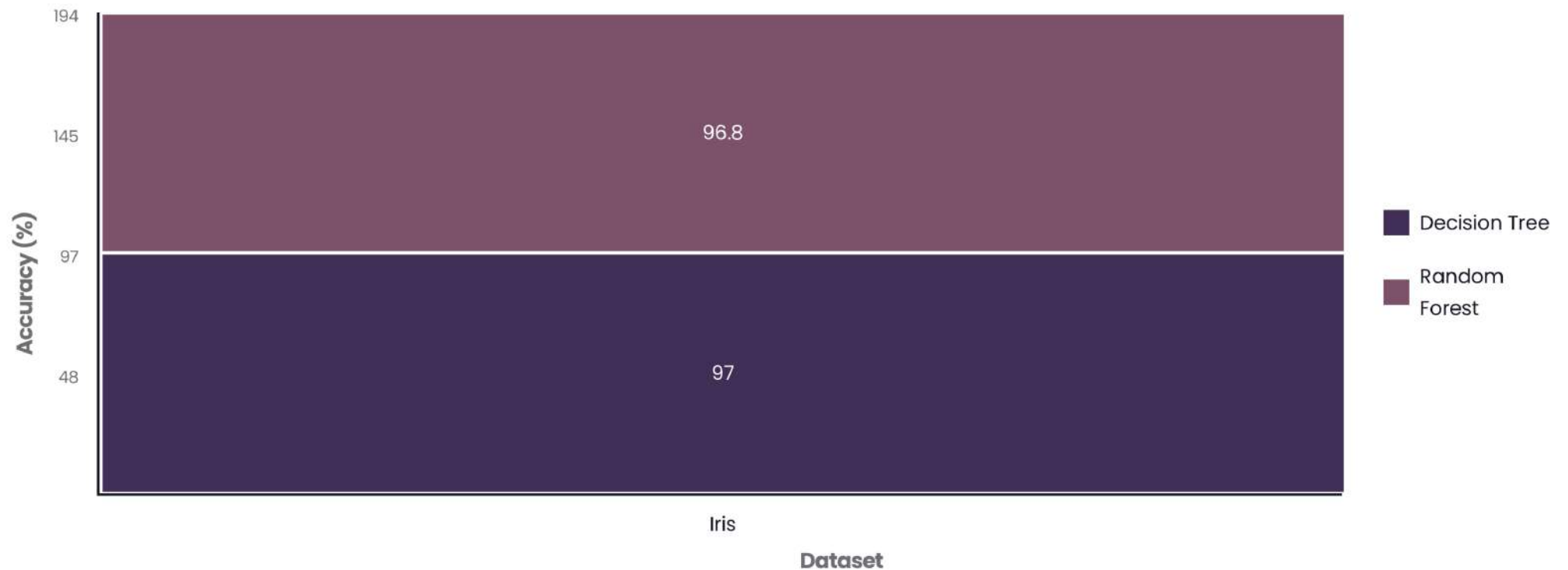
Streamlit framework building the web-based user interface



Leveraging open-source AI libraries accelerates no-code tool development, fostering collaboration and rapid prototyping

# FlowLab: Proven Accuracy and Enhanced Imaging

High-performance AI models and advanced MRI contrast enhancement



# FlowLab: Empowering Accessible AI & Medical Imaging

Simplifying AI workflows with no-code tools for education and research

- 1** FlowLab democratizes machine learning and medical image analysis through a no-code, browser-based platform accessible to beginners and researchers
- 2** Simplifies complex AI workflows to enhance learning and experimentation in academic and research environments
- 3** Future enhancements include adding support for deep learning models to expand AI capabilities
- 4** Incorporation of Explainable AI (XAI) tools to improve model transparency and interpretability
- 5** Deployment of cloud GPU execution to enable scalable and efficient processing
- 6** Integration with PACS systems to streamline medical data management and accessibility
- 7** These enhancements will extend FlowLab's impact and broaden its capabilities in AI research and education