

**MIKAIA®** is the ideal Digital Pathology solution for researchers for Viewing – Annotating – Processing – Analyzing Whole-Slide-Images or single images in brightfield or fluorescence.

We offer two editions:

- MIKAIA® lite** – free version without image analysis
- MIKAIA® studio** – additionally includes powerful set of image analysis Apps

### Highlights

**Native Windows Software** – no uploading of slides into the cloud required. Your data stays in safe hands – in yours!

**No Admin Rights required** – MIKAIA® lite Portable does not need to be installed and therefore needs no admin rights

**Open Pathology** – MIKAIA® supports many pyramidal and flat image formats. Slides can be converted into popular formats like SVS or DeepZoom. Annotations can be exported and imported from popular formats. Round trips are supported. The free tiling app lets you export the raw pixel data into image patches.

**Safe Annotations** – While annotating, your work will be frequently auto-saved. In case of a computer crash, the last auto-save can be recovered.

**Simple yet powerful** – we fight hard to keep the software simple and intuitive by exposing only those buttons and options that are absolutely necessary.

**App Center** – image analysis Apps are bundled in a central app center, so you can easily find the right app for you.

**Image 2 Spreadsheet** – MIKAIA® enables quantitative pathology. Analysis apps will not only produce and visualize annotations and slide-level results but also let you export the data into a CSV file structured in a way that you can seamlessly import it into your favorite statistics program.

**Batch Processing** – you can compose a workspace by selecting multiple local folders or network shares that will be monitored. Contained slides can be multi-selected and batch-analyzed or batch-converted

**Annotate Efficiently** – MIKAIA® offers tools beyond the standard rectangle, ellipse, polygon or line such as the margin tool, pen tool, emoji tool, single click hotspot tool, brush/eraser tool or content aware magic brush tool. Many of the tools support navigation so that an annotation can stretch beyond the current field-of-view.

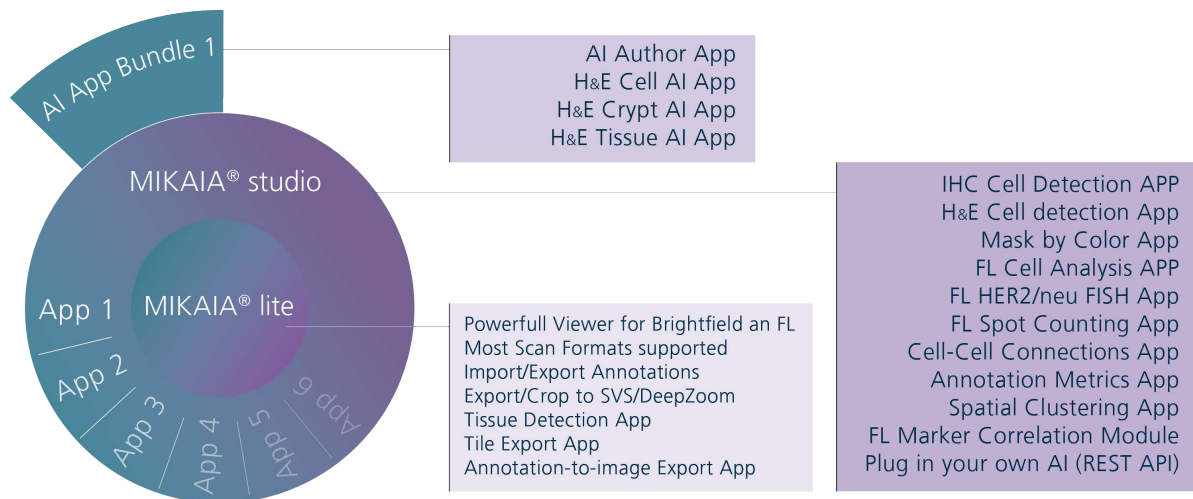
**Create Datasets** – we designed the annotation system to seamlessly support hundreds or thousands of annotations, organized into classes and custom stylable. You can export annotations into other formats or as images using the free Annotation-to-Image app.

**Touch-ready** – supports drawing annotations with pen and navigating (scaling, rotation, panning) with gestures.

### Features

MIKAIA®	lite	studio	Details
<b>Viewer</b>			
Brightfield and fluorescence	✓	✓	Change contrast, gamma, fluorescence channel false color, hide channels
Minimap with annotations	✓	✓	Navigation aid that shows the location of the current field-of-view in the entire scan
Kinetic scaling / panning	✓	✓	After mouse is released, the viewer will continue scaling or panning for a short while. Can be disabled
Density heatmap	✓	✓	Show heatmap based on spatial density of annotations
Multi-slide-view (grid view)	✓	✓	After manual alignment, viewers can be synced. Mouse-pointer is mirrored to other viewers.
Touch support	✓	✓	Pan, scale, rotate using gestures. Annotate using pen.
Stain unmixing	✓	✓	View only one component of H&E, DAB-H, custom stain. View optical density (helpful also in conjunction with content-aware magic brush).
<b>Image formats</b>			
Many WSI formats	✓	✓	SVS, TIF, OME-TIFF, MRXS, NDPIS, VMS, VMU, SCN, VSI, VMIC, QPTIFF, CZI (more coming soon. Yours not included? Please let us know!)
Flat image brightfield	✓	✓	Single field-of-view stored as jpg, png or tif
Flat image 3-ch. fluorescence	✓	✓	Interpret single field-of-view RGB image as 3 channel fluorescence
Export / crop to DeepZoom / SVS / TIF	✓	✓	A slide can be exported into these other pyramidal whole-slide-image formats.
Batch export	✓	✓	Select multiple slides. For each slide, a job will be added to the process queue.

MIKAIA®	lite	studio	Details
<b>Annotations</b>			
Organize annotations in stylable classes	✓	✓	Useful for creating datasets and for managing large amounts of annotations
Text support	✓	✓	Optionally, enter text for each annotation
Basic annotations tools	✓	✓	Ellipse, rectangle, line, single-click circle (for hotspots), polygon
Advanced annotations tools	✓	✓	Pen, tissue margin, brush with built-in eraser, emojis
Magic wand annotation tool	✓	✓	Content-aware brush/eraser
Pan while annotating	✓	✓	Many tools support navigating while annotating. This way an annotation can stretch beyond the current field-of-view.
Edit annotations after creation	✓	✓	Interactively change shape of annotations
Undo/redo support	✓	✓	Undo or redo the last annotation operations
Auto-save	✓	✓	To ensure that your annotations are not lost, they are auto-saved every few minutes
Recovery-after-crash	✓	✓	when the software or computer crashes, the last auto-save is recovered so your annotations are not lost
Annotation presets	✓	✓	Create your own annotation class presets (class names and styles). When annotating multiple slides, this ensures constant naming and styling and prevents ("tumor", "tumour", "Tumor", "tumor ", ...).
Export annotations to XML, Aperio XML, GeoJson, CSV	✓	✓	Enables round-trip with QuPath or Aperio
Import Annotations from Aperio XML, GeoJson, 3DHISTECH	✓	✓	Enables round-trip with QuPath or Aperio and import from 3DHISTECH CaseViewer
Decentral annotation storage	✓	✓	Annotations are stored in *.ano file (Zip with XML) next to slide. This way, slides (incl. annotations) can be moved around and annotations are accessible to anyone.
<b>Apps</b>			
Annotation-to-image Export App	✓	✓	Export annotations as images with configurable size and resolution
Tissue Detection App	✓		Outline Tissue in HE, IHC or mIF
Tile Export App	✓	✓	Exports WSI as tiles with configurable size, resolution, overlap. Combinable with foreground detection. Optionally also exports annotation masks along with each tile, which is useful for training segmentation AIs.
Image Analysis Apps		✓	List of Apps available in separate table below
Batch Image Analysis		✓	Select multiple slides and analyze them automatically one after the other. Annotations are added to each slide and results can be exported into a single comprehensive CSV file.
FL Colocalization Scatter Plots		✓	Not an App, but a dock panel, that provides fast insights on colocalizing markers in immunofluorescent slides. It shows a scatter plot per marker combination as well as a Pearson Correlation Channel Matrix.
<b>Extra</b>			
Training		✓	Remote training included with purchase of MIKAIA® studio
Support		✓	Email or telephone support included with purchase of MIKAIA® studio



MIKAIA® studio Apps			
Apps	studio	Add-Ons	Details
IHC Cell Detection App	✓		Detect (DAB+) positive and (H+) negative cells. Calculates density in cells/mm <sup>2</sup> . Statistics can be separated by ROIs, e.g. cell density inside and outside of tumor. With optional post-processing: find hotspots, group into clusters. Combined with custom stain unmixing, it can also be used for stains other than H-DAB.
HE Cell Detection App	✓		Detect and count nuclei in a H&E slide. Detected cells are not classified (AI based HE cell classification coming soon).
FL Colocalization App	✓		Detect nuclei in DAPI channel and then check colocalized intensity in other markers. Creates objects in one class per marker (e.g. „marker1+, marker2+“, „marker1+, marker2-“, ...). The detected cells (and their phenotypes) can serve as input for the Cell-Cell Connections App.
FL HER2/neu Scoring App	✓		Outline nuclei in DAPI channel and then detect and count gene amplifications in two other channels.
Cell-Cell-Connections App	✓		Examine cell-cell interactions by connecting adjacent cells with edges and calculate statistics over the created edges.
Annotation Metrics App	✓		Compute morphometric and color metrics for existing annotations. For brightfield scans, it can compute a color histogram of an unmixed stain (e.g. DAB in H-DAB) and derive grades (low/medium/high) for the stain intensity and positively stained area per annotation (“IHC Profiler”). For FL scans, it can compute the mean fluorescence intensity (MFI) per annotation. Groups adjacent existing cell annotations into clusters. A cluster can be user-defined: maximum distance in µm between any two cells and minimum number of cells per cluster.
Spatial Clustering App	✓		Groups adjacent existing cell annotations into clusters. A cluster can be user-defined: maximum distance in µm between any two cells and minimum number of cells per cluster.
Mask-by-Color App	✓		Create a mask based on a color. Use the color picker, select an unmixed stain, a FL channel or auto-mask bright or dark regions. Configure the mask fidelity. Also creates an inverse (negative) mask. The mask can be used as a ROI for downstream analyses, e.g. for IHC or FL cell analysis.
AI Author App („Train by Example“)		✓	User creates and trains their own classifier by defining two or more classes and providing example regions. The App is based on a “Few Shot Learning” AI and so it requires only few training annotations. Once an AI has been trained and performs well, it can be added to the App Center.

## Licensing

**MIKAIA® lite** and **MIKAIA® studio** are one and the same installer.  
**MIKAIA® lite** contains all features, but some of them are locked.

Features can be unlocked

Trial: via one-time voucher codes, e.g. each App execution consumes one voucher. (internet connection required)

Purchase: by importing a license activation file.

License types

(default): Perpetual („forever“) single license bound to computer

Can be upgraded into single-user floating license: use MIKAIA® anywhere in the LAN or home office. Only one user at a time.

Multi user floating license: e.g. up to N (unnamed) users can start MIKAIA® anywhere in the LAN or home office.

No internet connection required

Purchase includes remote training and support

Purchase includes one year of software updates

### Contact:

[www.mikaia.ai](http://www.mikaia.ai)

[mikaia@iis.fraunhofer.de](mailto:mikaia@iis.fraunhofer.de)

copyright: Fraunhofer IIS