INP
FROM IDEA TO PROTOTYPE

BLITZ and WOLKE

A lightweight framework for fast, scalable image data exploration

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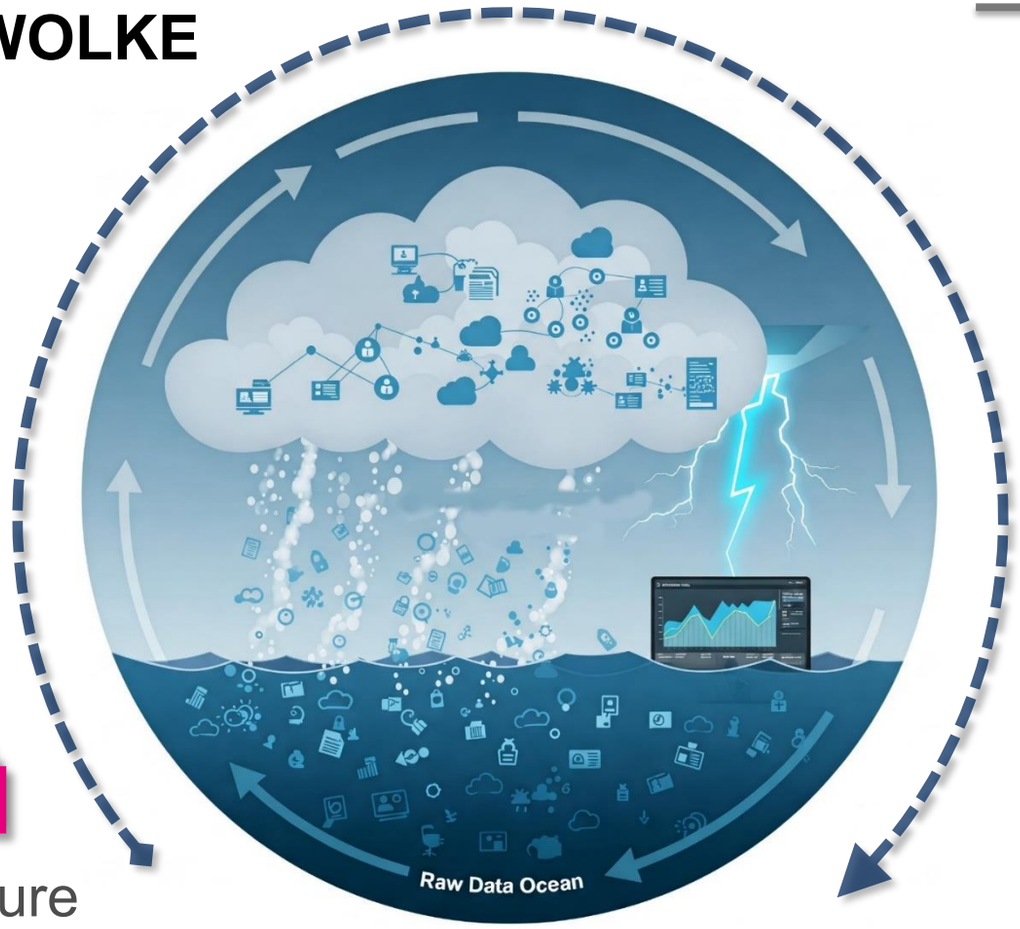
Leibniz
Association

FROM IDEA TO PROTOTYPE

Our Journey Today

An interactive web dashboard with Dash-Plotly for efficient metadata filtering and visualization.

WOLKE



WETTER

A modular, adaptable image data framework.

DAMPF

Metadata generator, transforming folders into searchable databases.

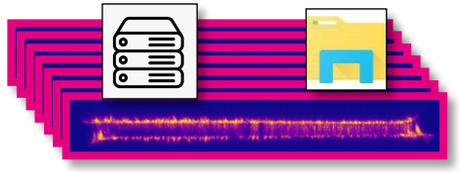
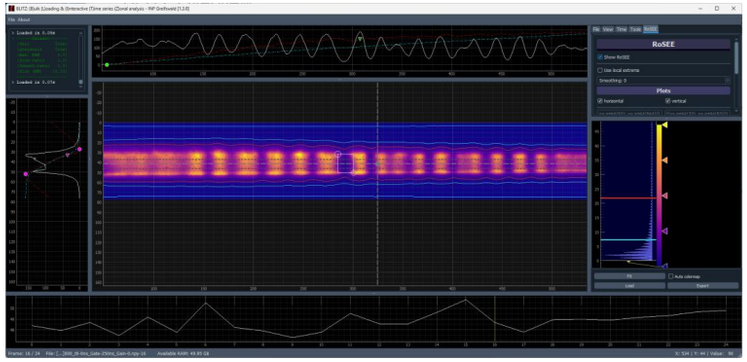


Image Folder Structure

Massive Amount of Raw Data

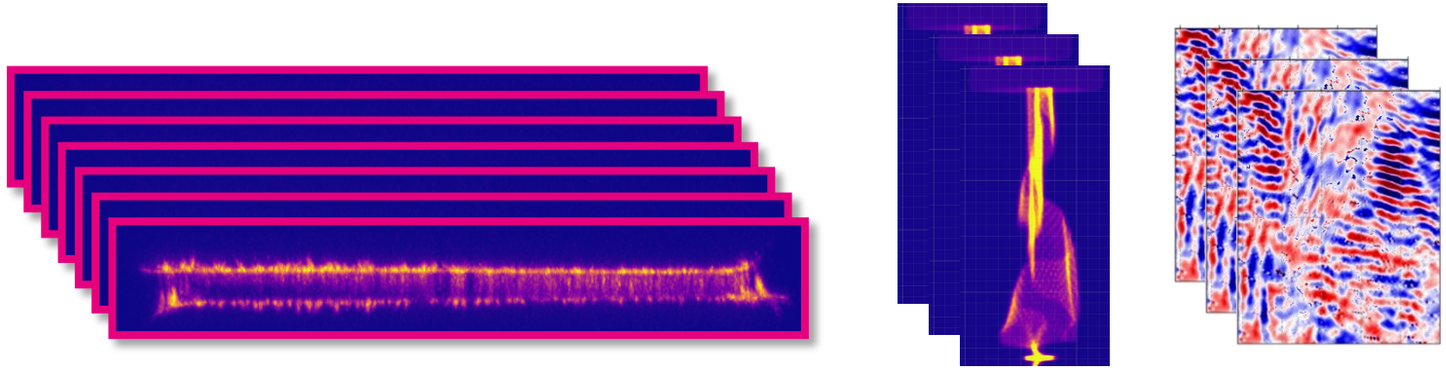
A matrix-based interactive image viewer for efficient large-scale image datasets.

BLITZ



We all know this problem… it's just toooooo many images

- From tens to billions of images
- In all shapes, colors, and formats



- From megabytes to terabytes — only IT is the limit
- Still often stored in folders, manually named and browsed

Laptop

External HDD

File Server

… and most of us still use:

- Standard image viewers
- File explorers
- Custom scripts

Microsoft Fotos

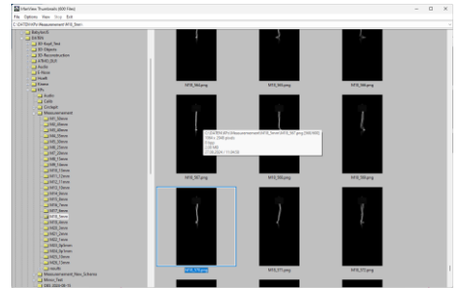
ImageJ

Python

Matlab

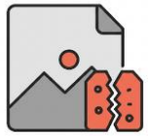
IrfanView

From Chaos to Insight – What's really missing

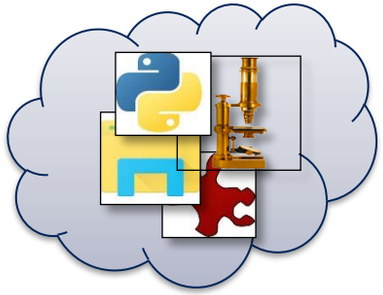


- Missing preselection:
  Images are opened manually or in bulk. No way to prefilter.

- Metadata chaos:
  Often incomplete, missing, or not connected to the image file.



- No central visualization:
  Viewers, scripts, notebooks — but nothing unified.

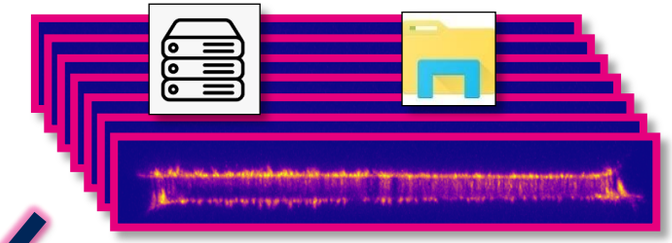


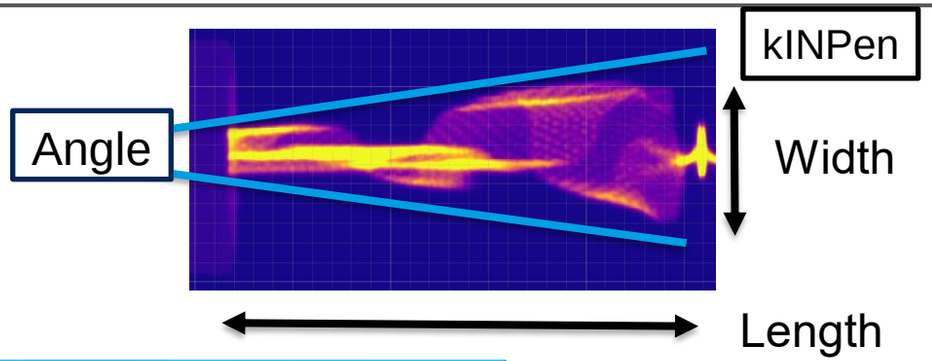
- No scaling beyond one set:
  Tools work for one dataset — but not for 30,000 files across 10 sets.

Each dataset is a small universe — containing tens of thousands of frames and multiple GBs of raw data.

DAMPF (**D**ata **A**ggregation & **M**odular **P**rocessing **F**ramework)

Image Folder Structure

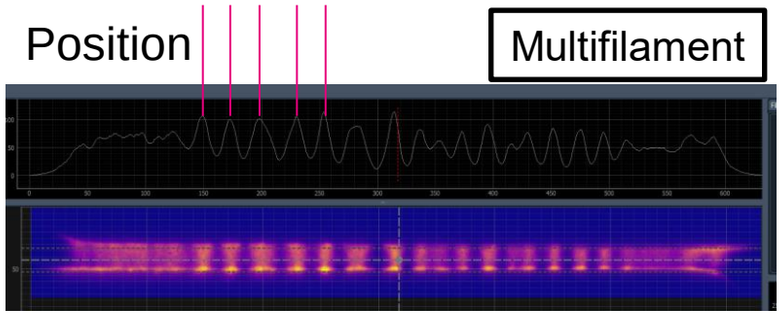




Non- Domain Specific Metrics

- Min, Max, Mean Intensity
- Laplacian („Noise“)
- Self-similarity (auto-correlation)
- Date / Time

Domain Specific Metrics



Experimental Conditions:

- Voltage
- Current
- Gas Mixture
- …

Structured SQL Metadata“

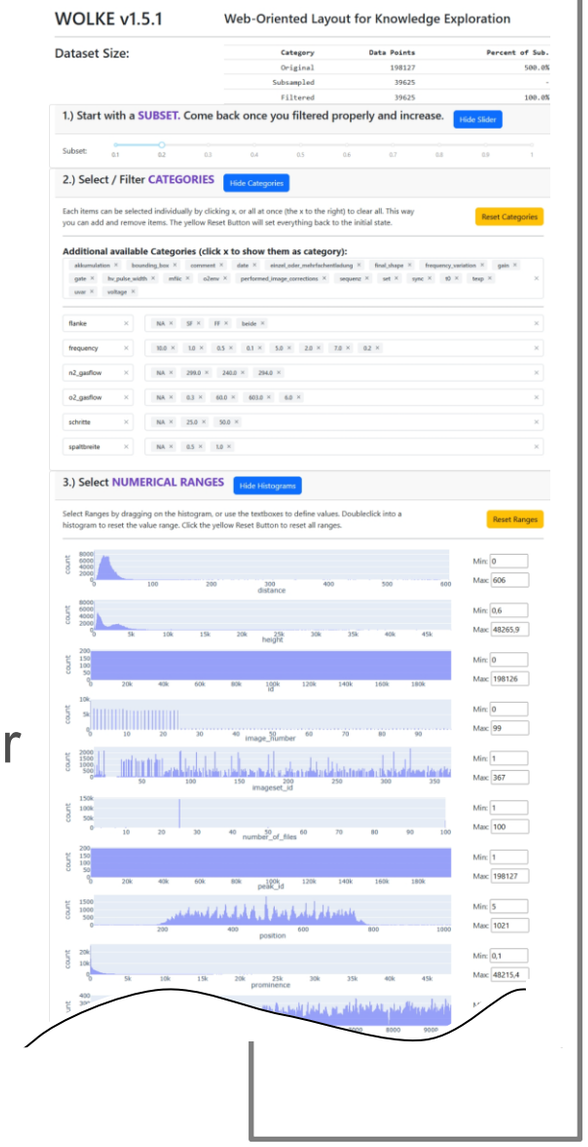
DAMPF: Metadata generator, transforming folders into searchable databases.

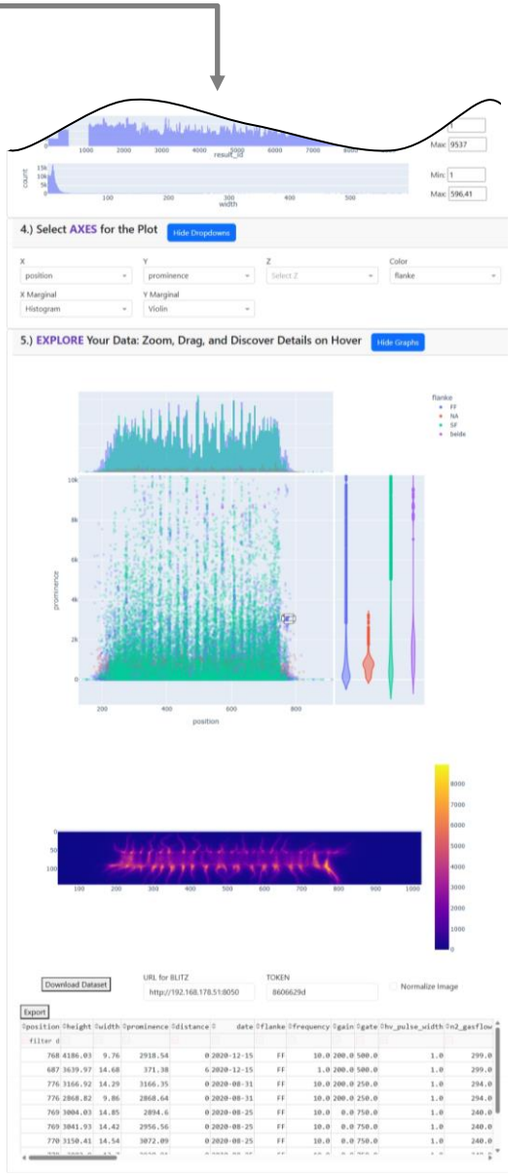
WOLKE (**W**eb-**O**riented **L**ayout for **K**nowledge **E**xploration)

An interactive web dashboard built with Dash-Plotly for efficient metadata filtering and visualization.

Functionality:

- Explore metadata by type: numeric or categorical
- Create interactive x/y/(z) scatter plots with color-coded metadata
- Seamlessly hand over selections to BLITZ or custom workflows





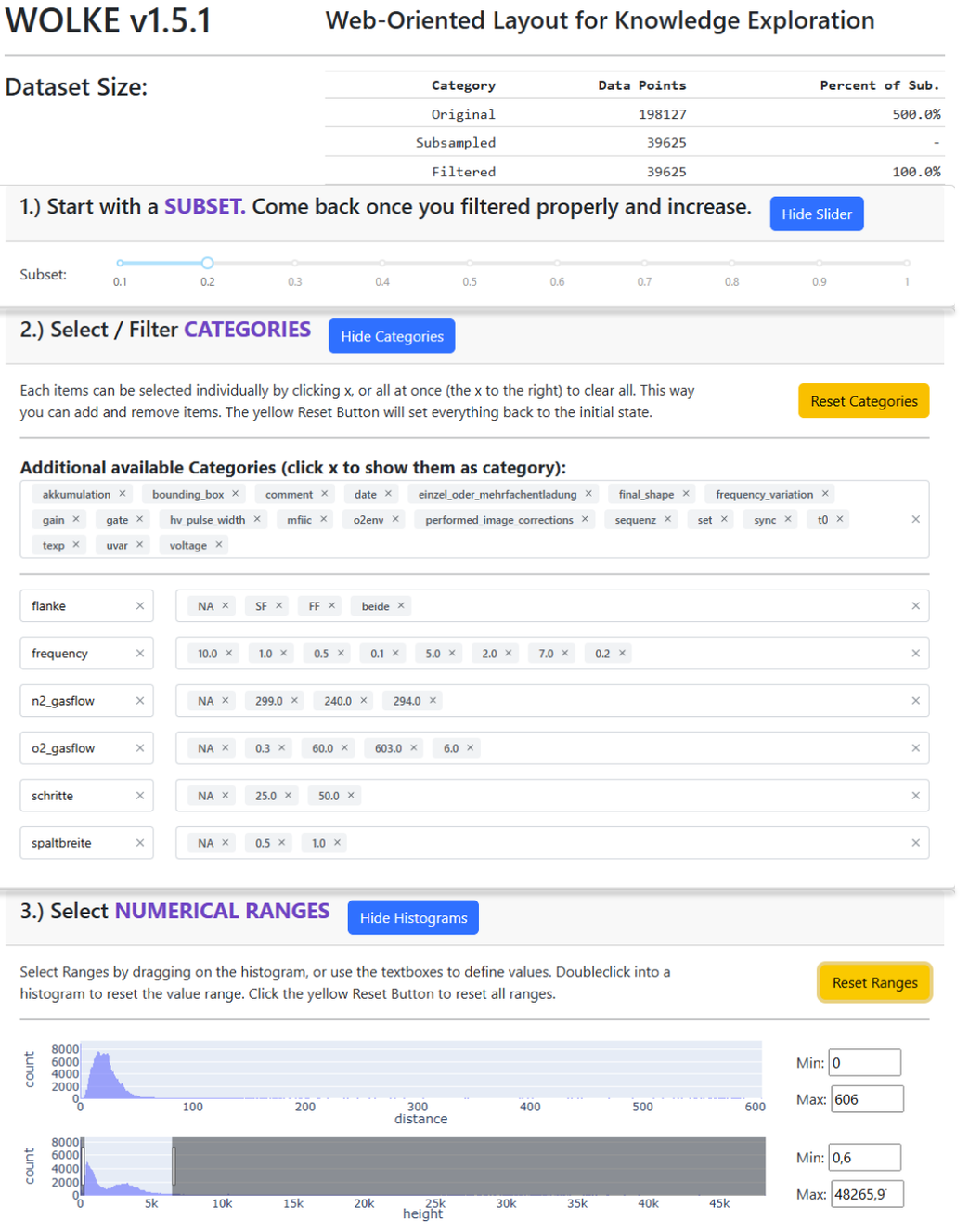
WOLKE helps researchers reduce complexity and focus on relevant subsets – no coding required.

Subset and Filtering

1.) Start with a Subset:

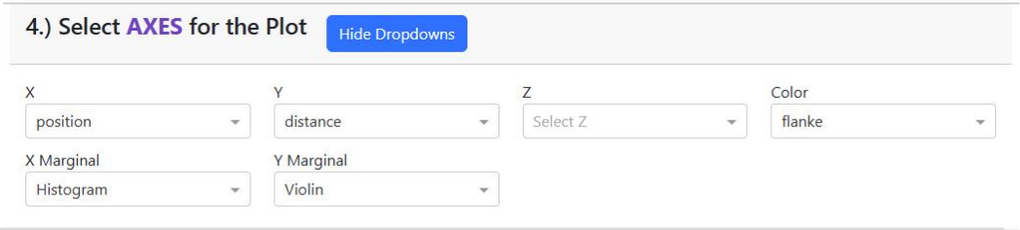
2.) Filter Categories:

3.) Filter Numerical Ranges:

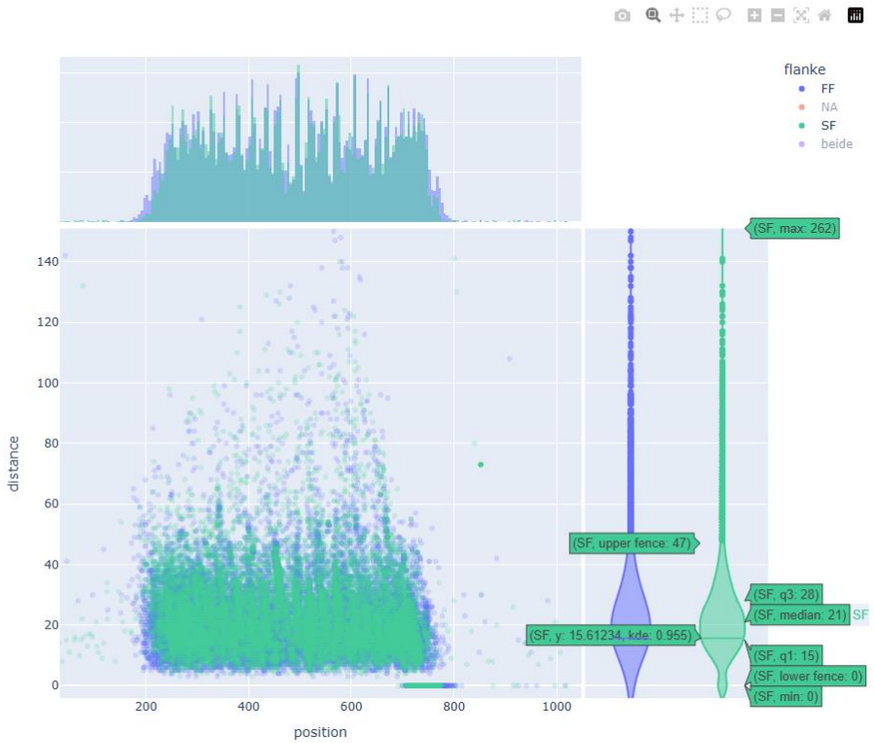


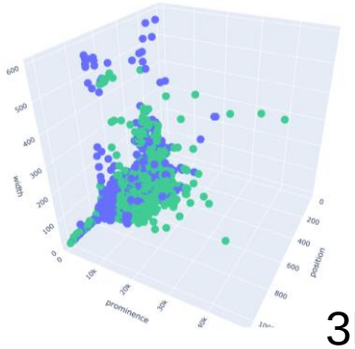
Visual Data Exploration

4.) Select Plot Axis:

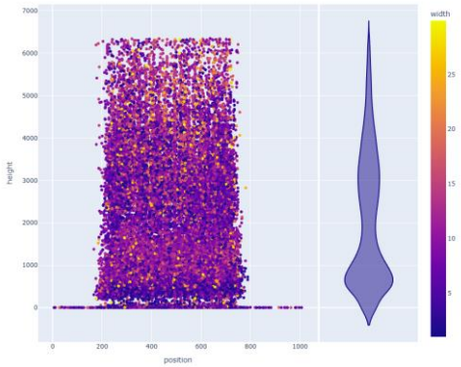


5.) Explore Your Data Visually:





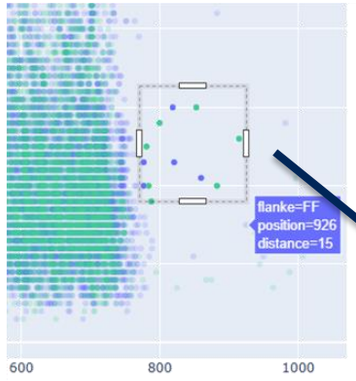
3D Scatter



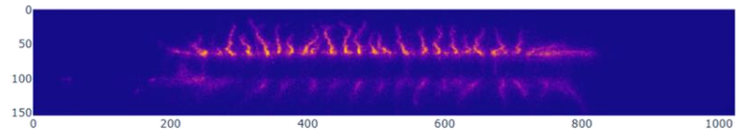
Continous Colorscale

From filtered metadata to deep image analysis — seamlessly.

Select



Inspect

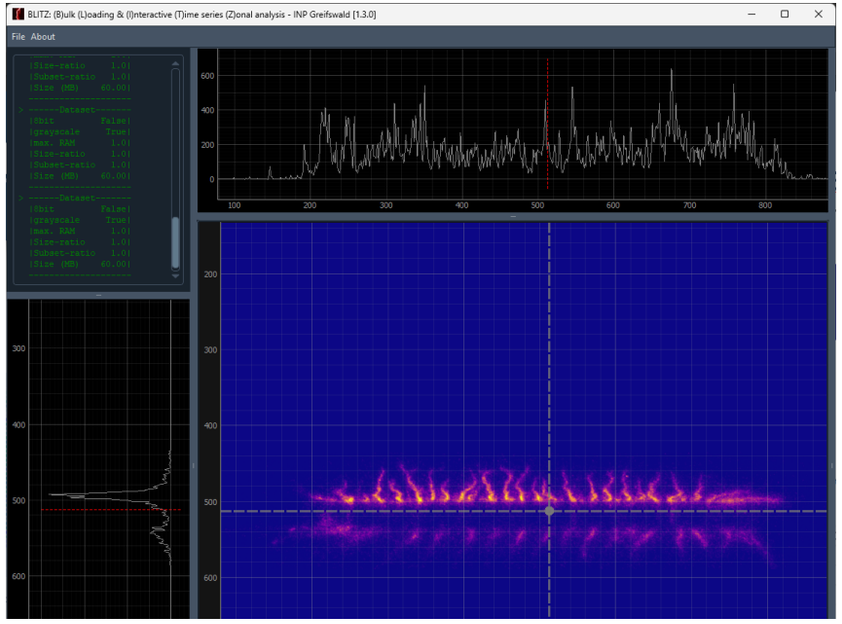


URL for BLITZ: http://192.168.178.51:8050 TOKEN: 8606629d Normalize Image

position	height	width	prominence	distance	date	flanke	frequency	gain	gate	hv_pulse_width	n2_gasflc
filter d											
669	3077.64	5.73	868.91	18	2020-08-13	FF	10.0	200.0	250.0	50.0	299.
331	2326.88	13.02	2253.48	40	2020-08-25	FF	10.0	0.0	250.0	1.0	240.
854	2.02	4.95	0.24	30	2021-01-13	FF	10.0	200.0	2.0	1.0	299.
778	929.48	3.46	32.51	20	2021-07-14	FF	10.0	200.0	250.0	0.2	299.
778	723.83	4.74	21.58	23	2021-07-14	FF	10.0	200.0	250.0	0.2	299.
524	903.93	22.43	836.69	32	2020-08-25	FF	10.0	200.0	750.0	50.0	240.
362	2357.59	8.26	1876.06	16	2020-08-25	FF	10.0	200.0	750.0	10.0	240.

LIVE Link

WOLKE ↔ BLITZ



WOLKE provides filtered data via HTTP as *.npy arrays,
which can be instantly opened in BLITZ —
or integrated into your own analysis framework.

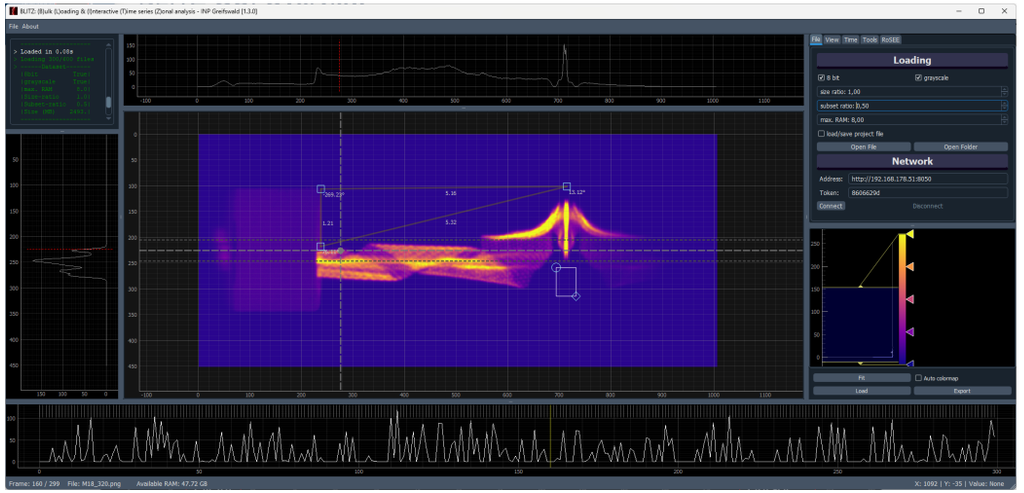
BLITZ (**B**ulk **L**oading & **I**nteractive **T**ime-series **Z**onal analysis)

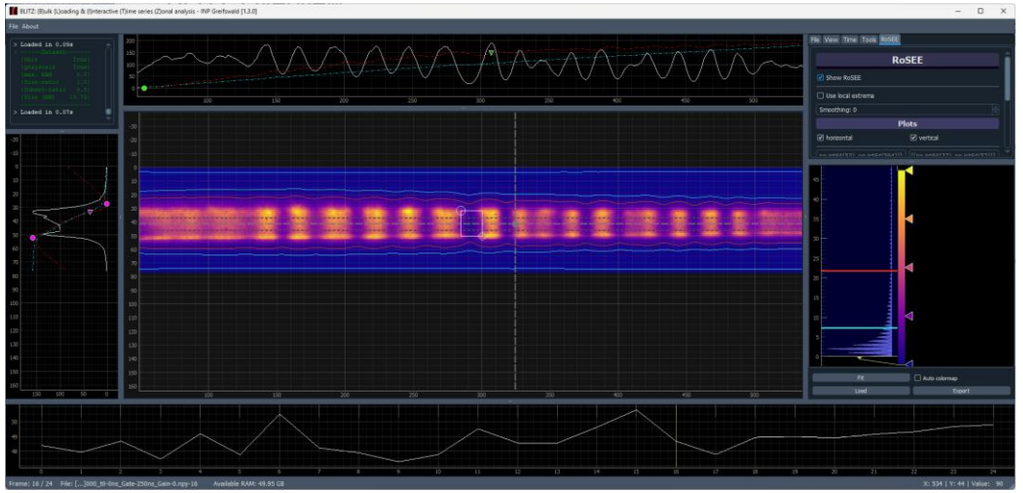
Definition and Purpose:

- Matrix-based interactive image viewer
- Designed for efficient large-scale image datasets

Key Features:

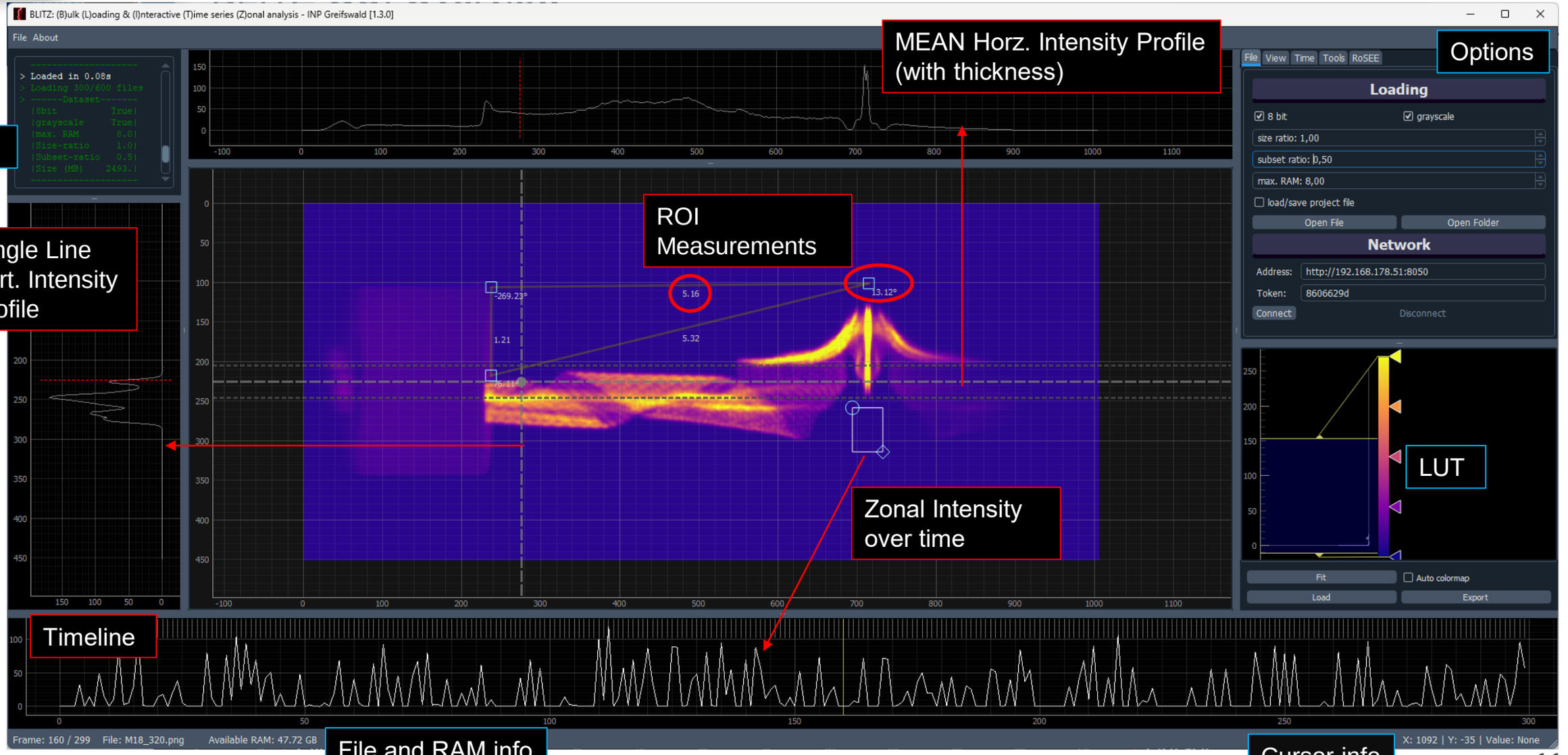
- Loads 21,000 images (25 GB) in 35 seconds
- Interactive tools: measure, profile, explore ROIs
- Drag & Drop support for quick dataset loading





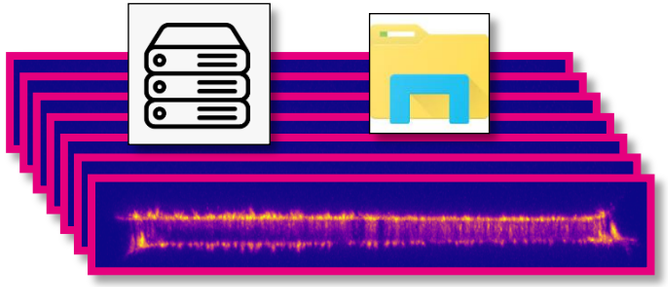
From loading to insight – in under a second.

BLITZ (**B**ulk **L**oading & **I**nteractive **T**ime-series **Z**onal analysis)



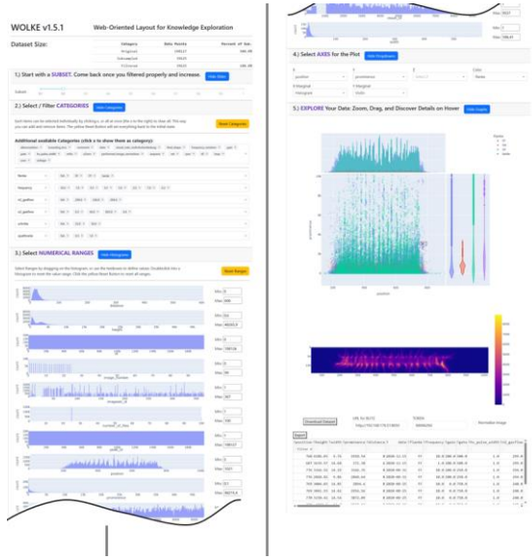
From Folder to Insight:
Your Workflow with DAMPF, WOLKE & BLITZ

Keep your image data in folders
…just like you're used to!

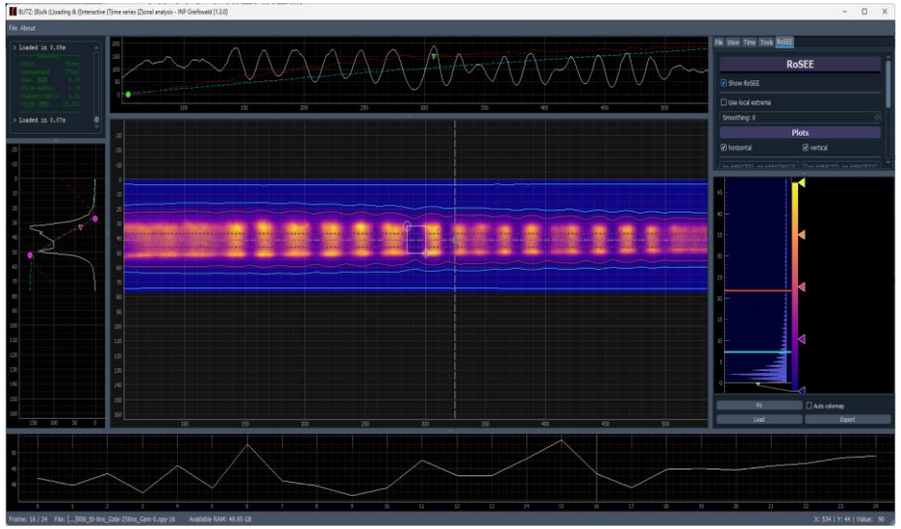


Augment metadata
with DAMPF
(and store in SQL)

Filter and preselect
using WOLKE



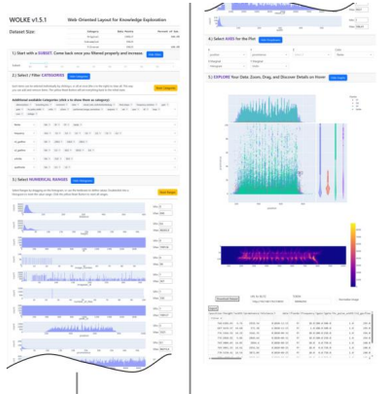
Shortcut:
Preview directly with BLITZ
(Drag & Drop sneak peek)



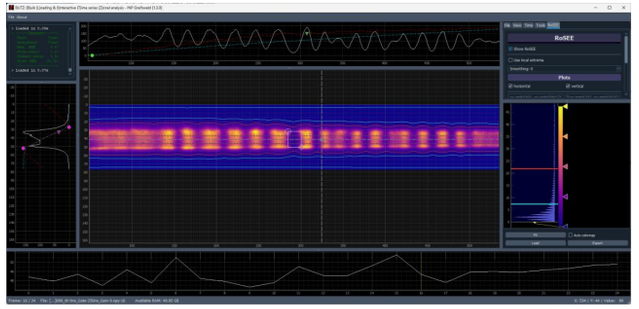
Synchronize LIVE
filtered sets with BLITZ
for detailed inspection

Outlook: WETTER Framework

GitHub

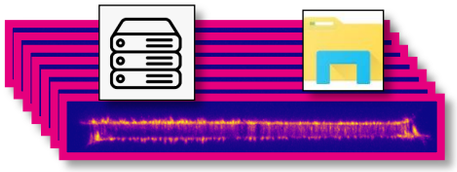


WOLKE



BLITZ

DAMPF



Your Contribution?

HAGEL Get rid of heavy outliers

SCHNEE
Solidify trustworthy data

NEBEL
Reveal Patterns in the fog of data

REGEN
Gather new Data by learning from the old