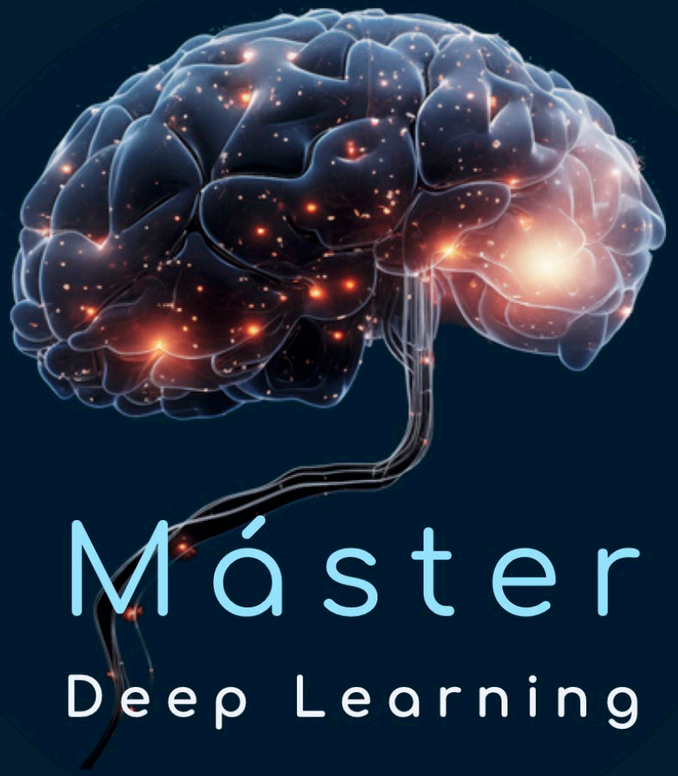
MLOps

Part 4.

Experiment tracking with Weights and Biases (W&B)



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What are W&B Experiments & Runs?

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Basic Unit

A Run is the basic unit of computation logged

Track Everything

Hyperparameters, code versions, metrics, system usage

Model Outputs

Predictions, media, plots, datasets, model files

Central Goal

Centralize, visualize, compare, and share ML work

Creating & Configuring an Experiment

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Framework Integrations

W&B supports 30+ libraries including PyTorch, TensorFlow, Hugging Face, and scikit-learn with minimal code changes.

Platform Compatibility

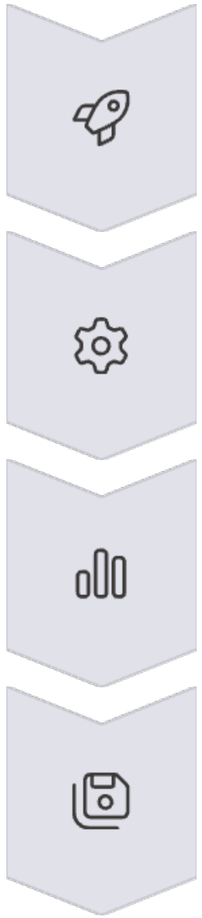
Works seamlessly with cloud services like AWS SageMaker, Databricks, and Azure, plus local environments.

Custom Integration

Add W&B to any library using our simple SDK or leverage our API hooks for specialized tracking needs.

Setting up W&B experiments is straightforward regardless of your ML stack. Initialize with **wandb.init()**, configure key parameters, and integrate with your favorite frameworks through dedicated callbacks.

Creating & Configuring an Experiment (II)



Initialize

run = wandb.init(project="...", entity="...", config={...})

Access Config

run.config.learning_rate

Log Metrics

run.log({"loss": loss_value})

Finish

Automatic with context manager or run.finish()

Logging Data: Metrics, Media & More

Metrics

Scalars changing over time (loss, accuracy)

Media

Images, video, audio, HTML, point clouds

Plots

Custom charts via wandb.Plotly(), etc.

Summary

Track final values with run.summary

Viewing Results: Projects & Workspaces

Project

Container for related runs

Access via wandb.ai/entity/project-name

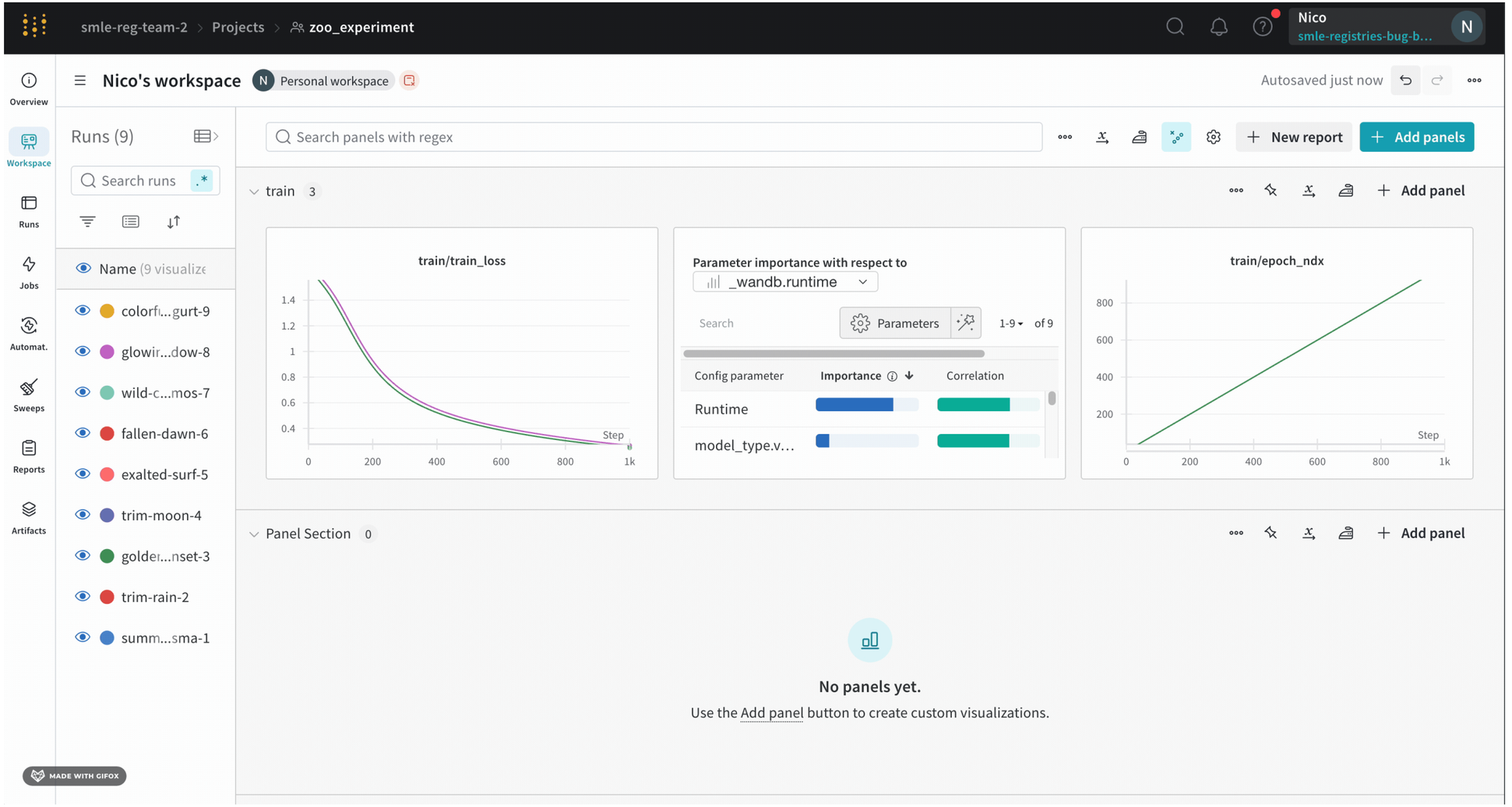
Workspace

Primary analysis dashboard

Runs sidebar, visualization panels

Key Tabs

Overview, Workspace, Runs, Sweeps, Reports, Artifacts


smle-reg-team-2 > Projects > zoo_experiment
Nico
smle-registries-bug-b...
Nico's workspace
Personal workspace
Autosaved just now
Overview
Workspace
Runs
Jobs
Automat.
Sweeps
Reports
Artifacts
Runs (9)
Search runs
Name (9 visualize
colorfi...gurt-9
glowir...dow-8
wild-c...mos-7
fallen-dawn-6
exalted-surf-5
trim-moon-4
golder...nset-3
trim-rain-2
summ...sma-1
Search panels with regex
New report
Add panels
train 3
Add panel
train/train_loss
Step
Parameter importance with respect to
_wandb.runtime
Search
Parameters
1-9 of 9
Config parameter
Importance
Correlation
Runtime
model_type.v...
train/epoch_ndx
Step
Panel Section 0
Add panel
No panels yet.
Use the Add panel button to create custom visualizations.
MADE WITH GIFOX

Analyzing Runs in the Workspace

Filtering

Narrow down runs based on config, tags, state

Grouping

Group runs by config values

Sorting

Order runs by metric values

Visualizations

Line plots, scatter plots, bar charts

The Run Page: Deep Dive into a Single Run

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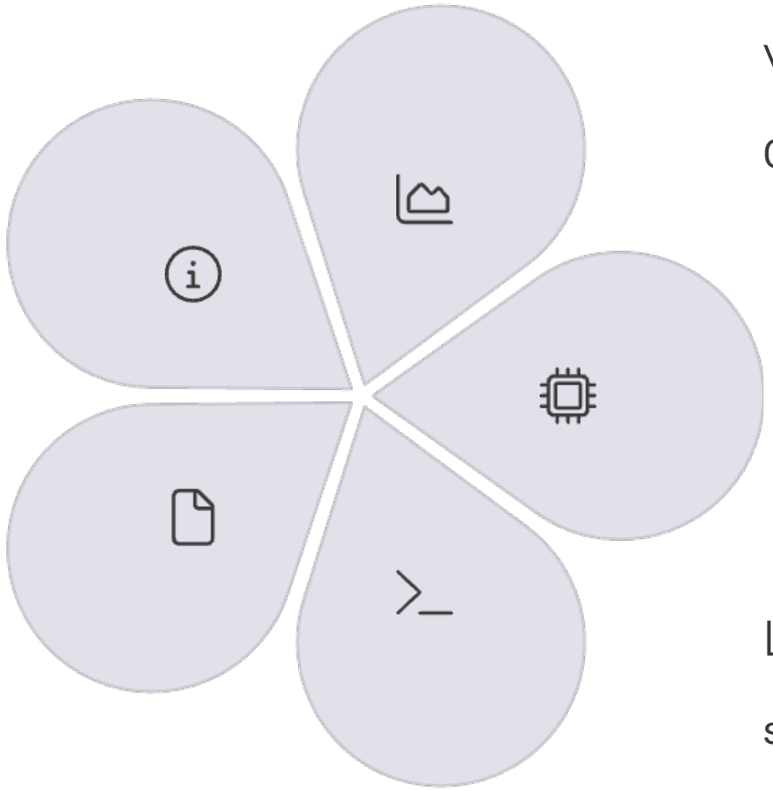
Overview

Metadata, config, summary, git state

Files

Saved files and model checkpoints



Workspace

Charts specific to this run

System

CPU/GPU/Memory usage graphs

Logs

stdout/stderr from the run

Organizing & Managing Experiments

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1

Projects

Primary organizational unit

2

Naming & Tags

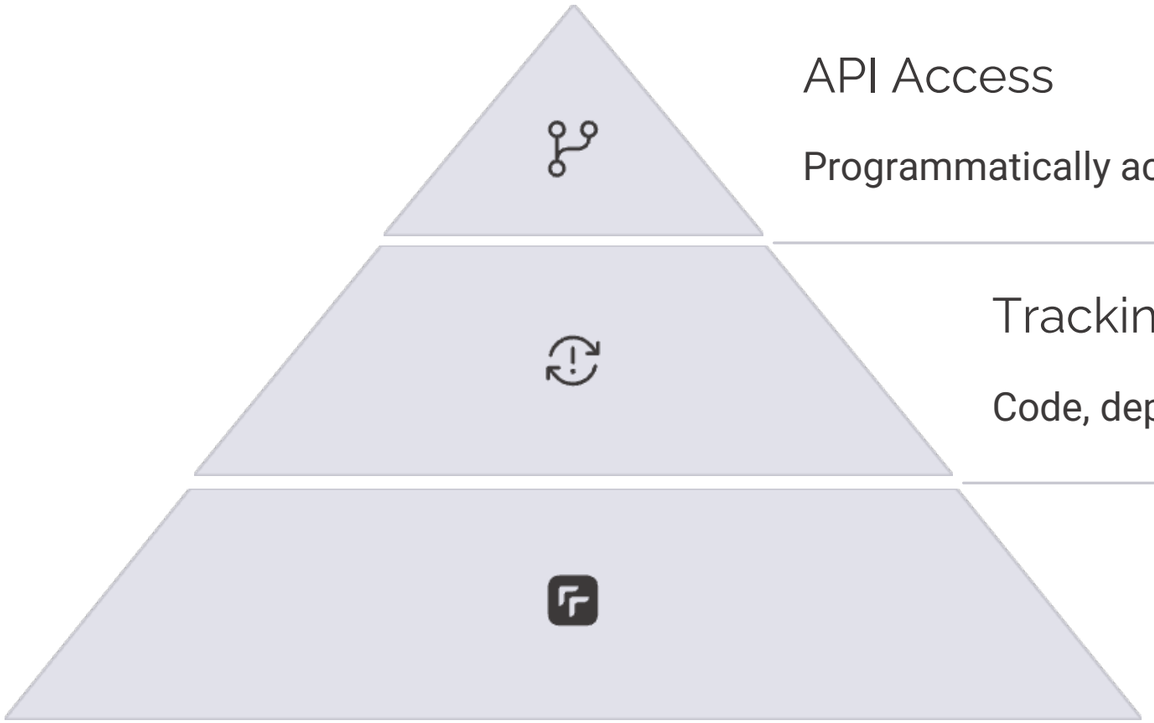
Use meaningful names and labels

3

Groups & Job Types

Categorize related runs

Reproducibility & API Interaction



API Access

Programmatically access run data

Tracking

Code, dependencies, config, data/models

Reproduction

Use Overview/Files/Code to reproduce