



Harvard John A. Paulson
School of Engineering
and Applied Sciences

Silence to Sound

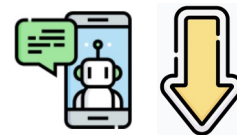
Generate Visually Aligned Sound for Videos

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Oct 24th, Midterm Presentation

Problem Statement

Motivation

- Video has no sound
- Noise in soundtrack



Our Solution: API that generates sound

Motivation


- Video has no sound
- Noise in soundtrack

Potential Usage

- Video sound restoring
- Video de-noising
- Viewer experience enhancement
- Accessibility


Silent to Sound

Generate sound effects from image or silent video



Upload your image or video here


Browse file from your computer



Audio Duration

10 sec


Create




Result

Silent to Sound

Generate sound effects from image or silent video






Audio Duration

10 sec

Create

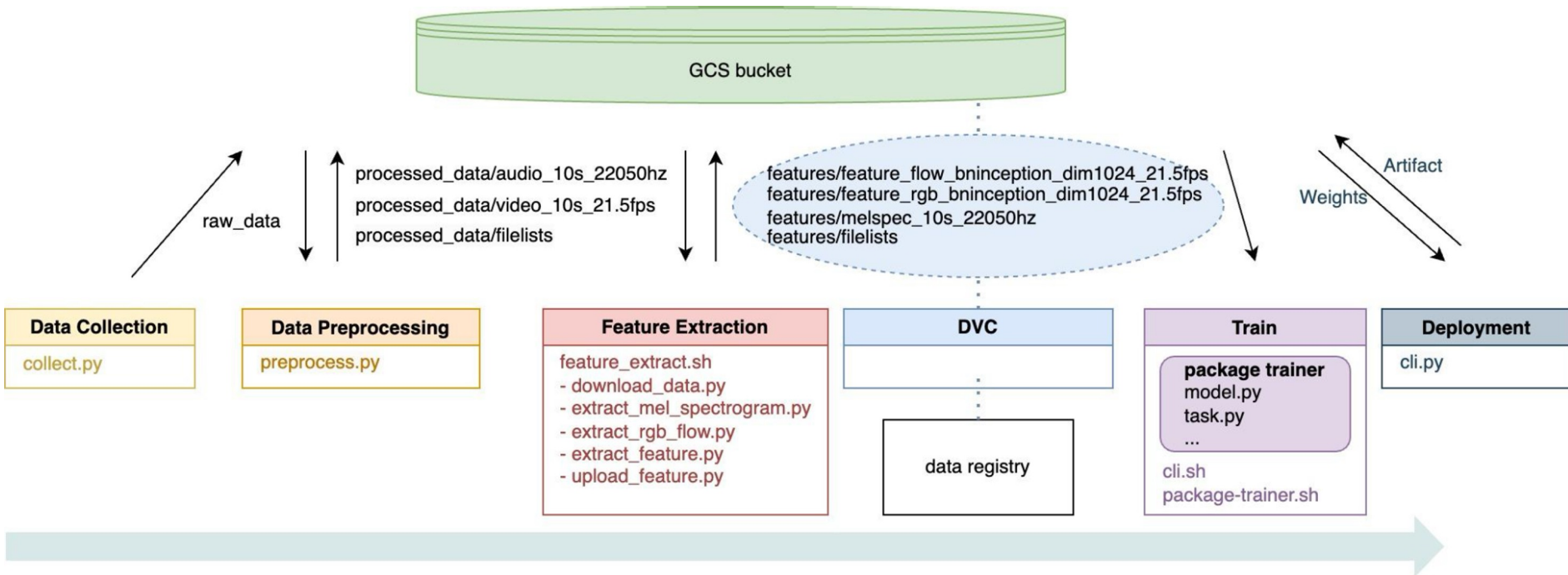
Enjoy your sound!



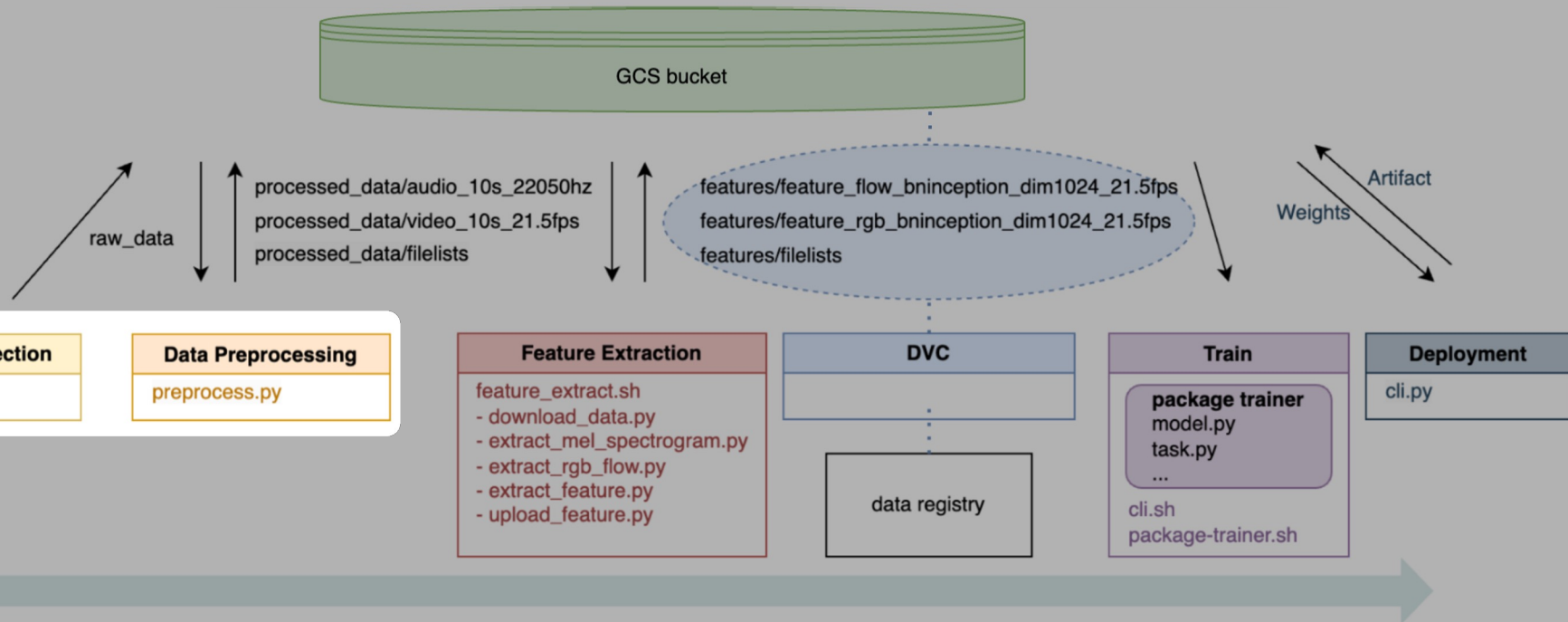
0:00:02 -0:0:08



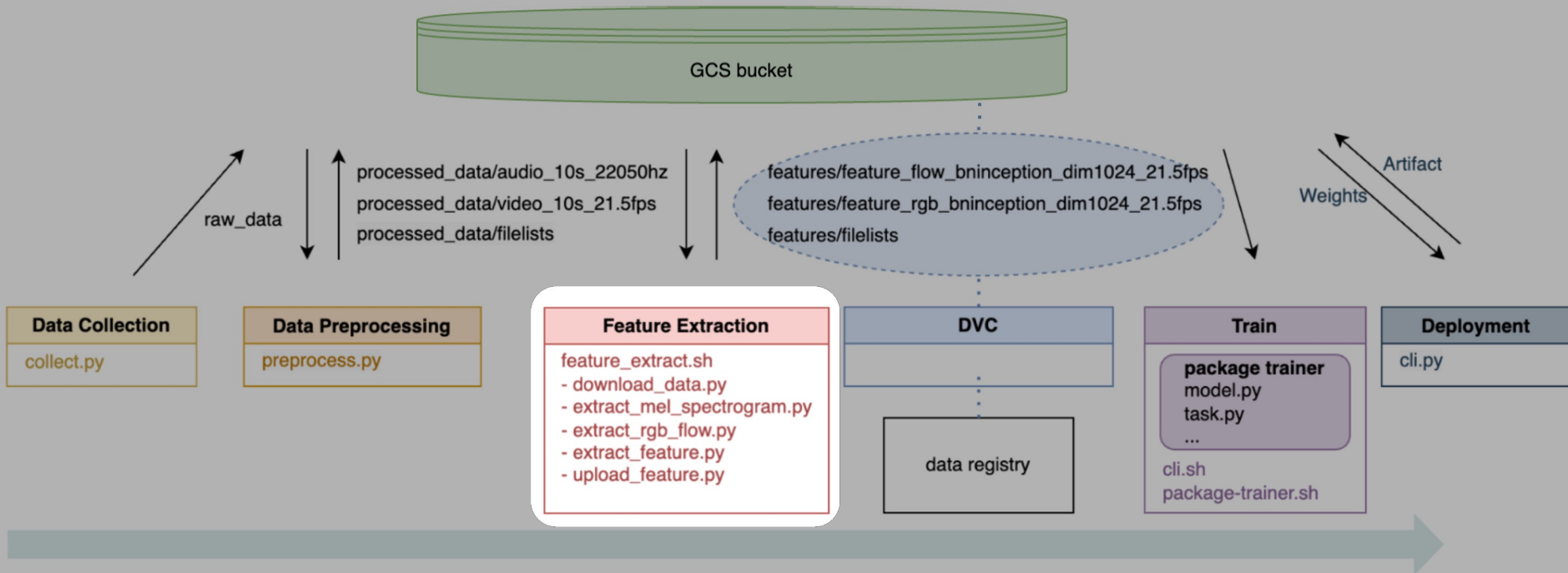
Pipeline Overview



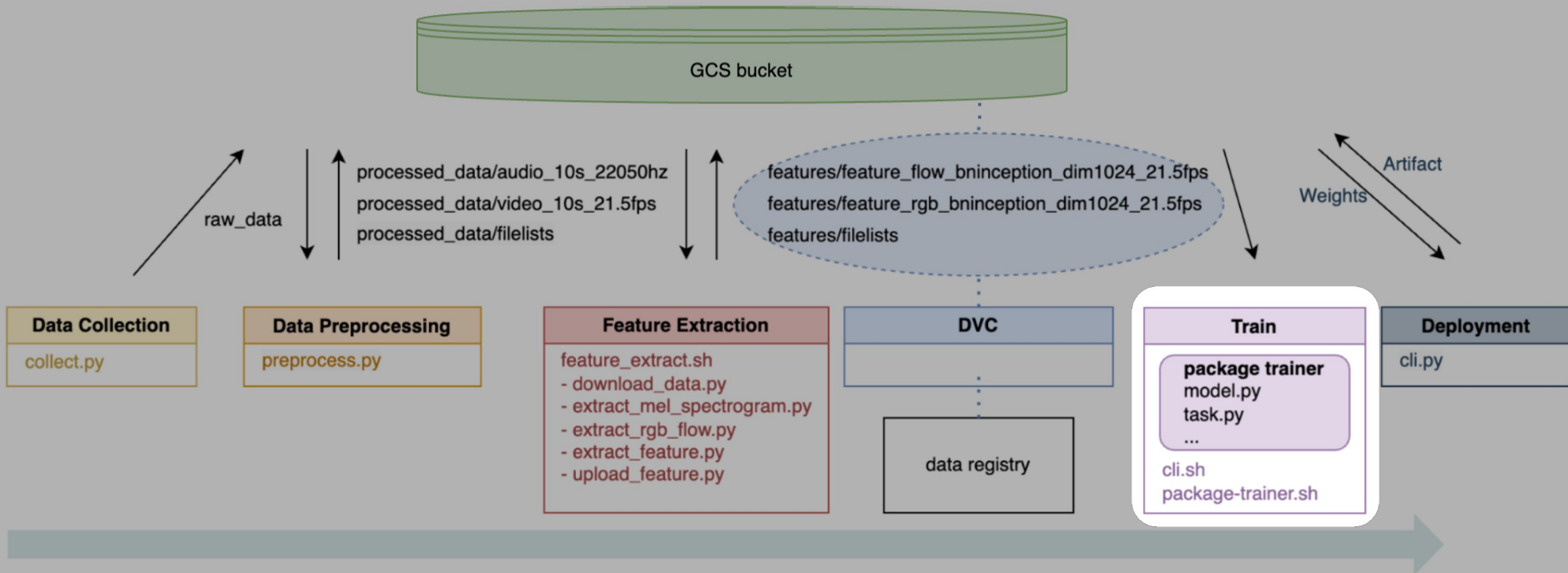
Pipeline Overview



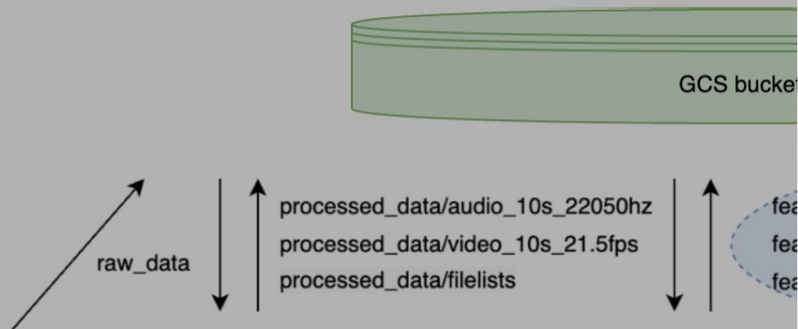
Pipeline Overview



Pipeline Overview



Pipeline Overview



Data Collection

collect.py

Data Preprocessing

preprocess.py

Feature Extraction

feature_extract.sh
- download_data.py
- extract_mel_spectrogram
- extract_rgb_flow.py
- extract_feature.py
- upload_feature.py



ml-pipeline-20231024040732

CLONE

STOP

Runtime Graph

3/5 steps completed



Expand Artifacts

88%



Data Collector

lildanni/data-collection



Data Processor

lildanni/data-preprocessing



Feature Extractor

lildanni/feature-extraction



Model Training

python:3.10



Model Deploy

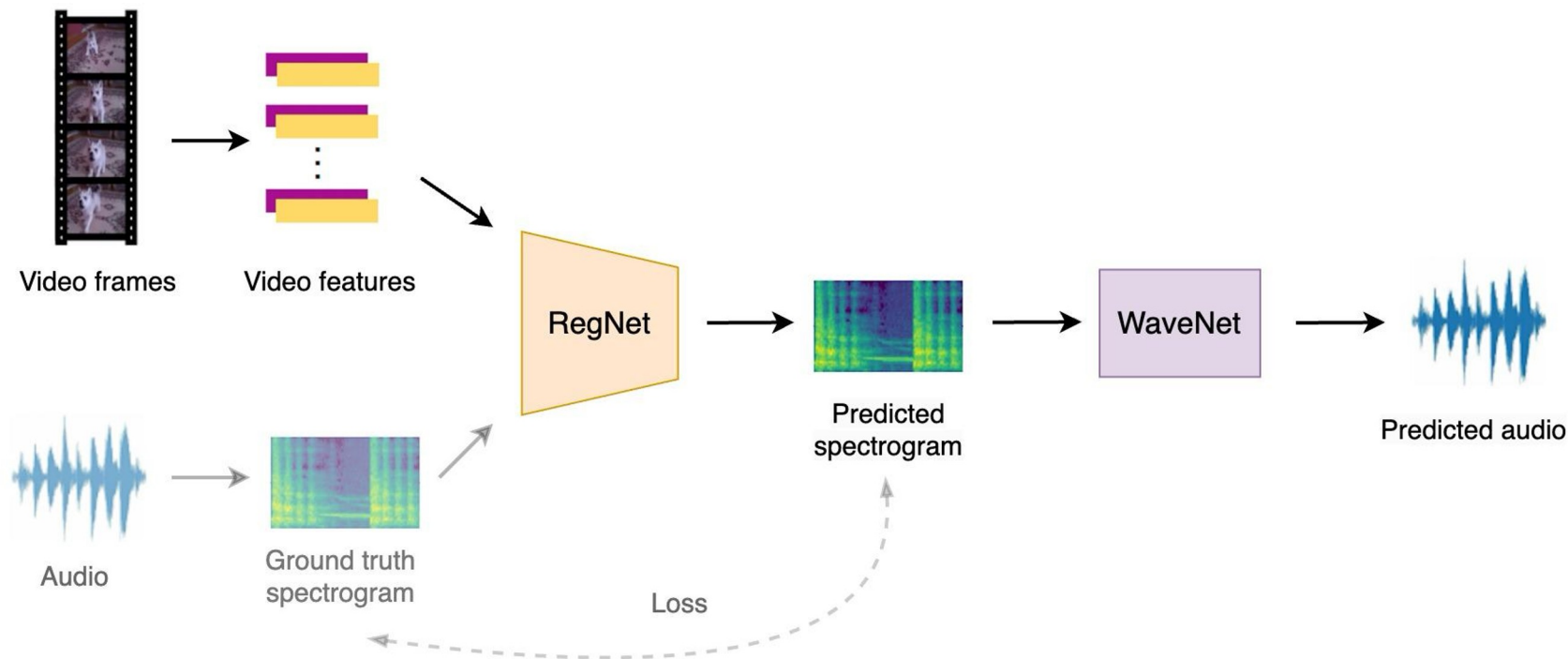
python:3.10



Deployment



Model Training

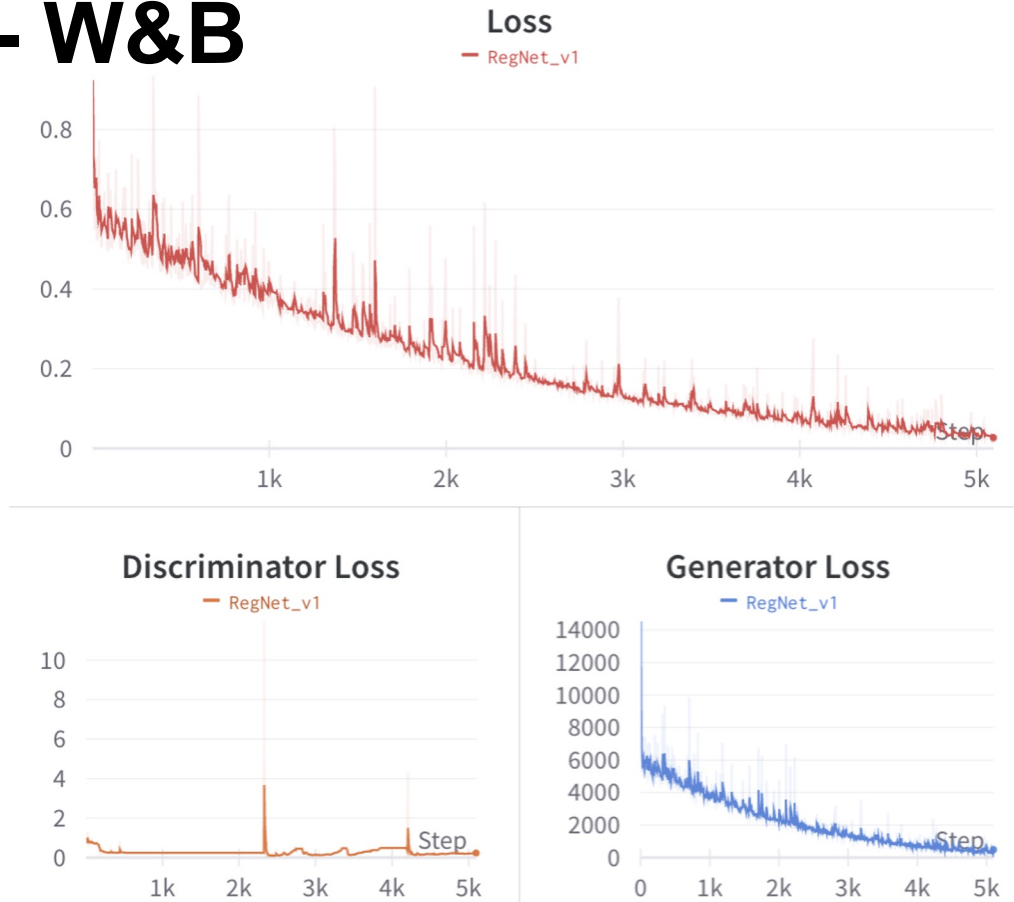


Training History - W&B

- 30 Epochs
- $lr = 2e-4$
- $batch_size = 4$

Regularization

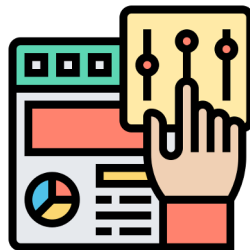
- $weight_decay = 1e-6$
- $grad_clip_thresh = 1.0$



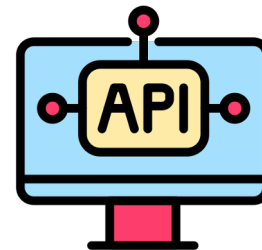
Next Steps



Finalize Model
Deployment



Design
User Interface



APIs & Frontend-
Backend Integration





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WHERE
SCIENCE
AND
ENGINEERING
CONVERGE



Thank you!