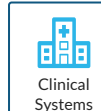# Medical Image Processing & Analytics - Predicting Pneumonia in Chest X-Rays
Solution Architecture

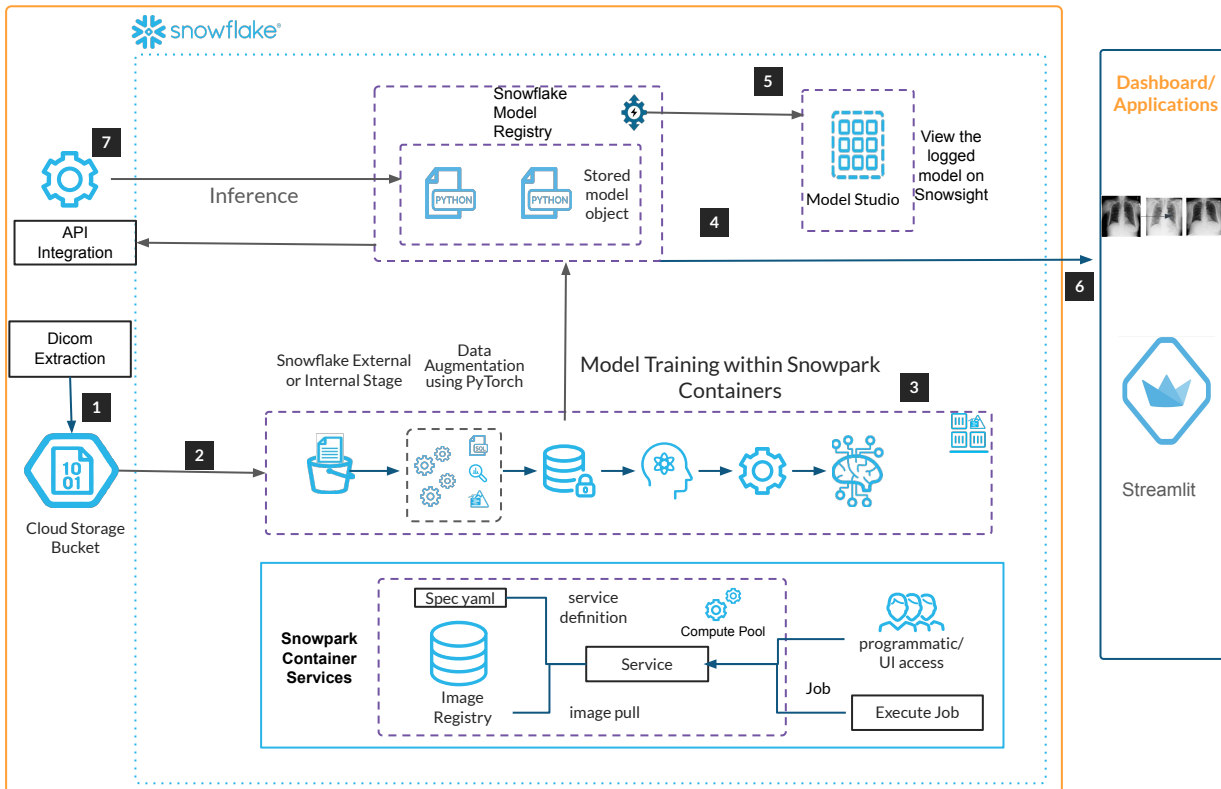**Data Sources**

Clinical Systems

Medical Systems

Vendor Neutral Archive

snowflake

7

API Integration

Inference

Snowflake Model Registry

PYTHON

PYTHON

Stored model object

5

Model Studio

View the logged model on Snowsight

4

Dashboard/ Applications

Streamlit

6

1

Dicom Extraction

Cloud Storage Bucket

2

Snowflake External or Internal Stage

Data Augmentation using PyTorch

Model Training within Snowpark Containers

3

Snowpark Container Services

Spec yaml

Image Registry

service definition

Compute Pool

Service

image pull

Job

programmatic/ UI access

Execute Job

OBJECTIVE

Detect Pneumonia in Chest X Rays by training a PyTorch image classification model from torchvision models using transfer learning. Leverage Snowpark Container Services for training and logging/manage the model in the Snowpark Model Registry. Deploy it to carry inference using Snowflake Warehouses (CPUs). Deploy ongoing inference using a Streamlit in Snowflake app or integration with external applications.

USE-CASE FLOW

1. Medical Images from PACS or Vendor Neutral Archives are pulled and landed into cloud storage buckets and referenced in Snowflake using external or internal stages

2. Fetch the images from the stage and carry techniques like data augmentation on the images.

3. Leverage Snowpark Container Service for Model Training with the power of GPUs. The model training job is deployed as a container service that can be invoked for training on training images stored in the Snowflake stage.

4. The trained model is logged into Snowflake Model Registry to carry ongoing inference

5. Models page in Snowsight allows you to find and explore machine learning models that you can use in Snowflake.

6. Medical Image Classification App built in Streamlit provides the ability to visualize ng inference on any new images ingested to stage.

7. The inference can be also be carried out from an external application using an API Integration