

NAIRR Pilot

National Artificial Intelligence
Research Resource Pilot

Accelerating AI/ML Research with AWS

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AI Workshop Denver, CO April 2-3, 2025

[PLACEHOLDER - AWS Names/Bios]



AWS resources for NAIRR researchers

- AWS Credits for full range of AWS Services
- 650+ publicly available
- 350+ built-in algorithms & pre-trained models and 100+ public & proprietary foundation models in Amazon Bedrock
- Project support from NSF CloudBank and AWS
- On-demand

AI to drive research & innovation

Data analysis & pattern recognition:
analyze massive datasets to uncover hidden patterns



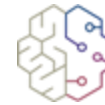
Natural language processing:
analyze text, summarize papers, detect sentiment

Computer vision:
analyze medical images, microscopy, environmental data

Physics Modelling:
speed up complex simulations - learning patterns and approximating solutions

Drug discovery:
AI predicts drug interactions and designs new candidates Robotics & lab automation

AWS services:



Amazon



Bedrock

Amazon



SageMaker

Amazon



Rekognition

Amazon



Comprehend

AWS



HealthLake

AWS

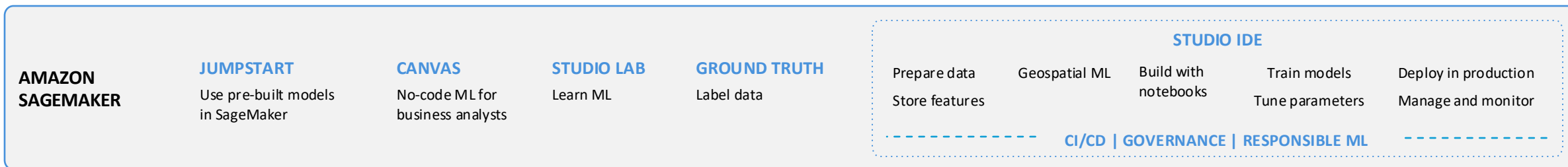
HealthOmics

The AWS AI/ML Stack

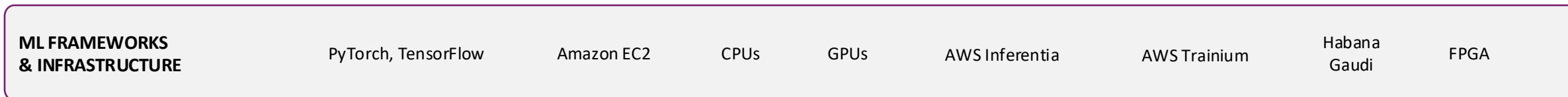
Consumer



Tuner



Provider



GPUs and accelerators

Comprehensive, secure, price-
performant infrastructure for

AI Workloads

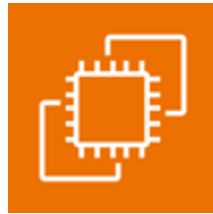
P4d NVIDIA A100-40GB	P4de NVIDIA A100-80GB	P5 NVIDIA H100	P5e NVIDIA H200	P5en NVIDIA H200
G5 NVIDIA A10G	G6 NVIDIA L4	G6e NVIDIA L40s	Trn1 AWS Trainium	Trn2 AWS Trainium2
Inf1 AWS Inferentia	Inf2 AWS Inferentia2	DL1 Intel Gaudi 1	DL2q Qualcomm AI100	

Storage & managed services for AI/ML apps

Storage services



Amazon EBS



Amazon EC2 local
storage



Amazon S3



Amazon FSx for
Lustre

Managed services



Amazon
SageMaker



Amazon EKS



Amazon
ECS



AWS
ParallelCluster



AWS Batch

NEW

Collaborate and build faster with a single data and AI development environment

Develop and scale AI use cases with the broadest set of tools

Reduce data silos with an open lakehouse to unify all your data

Meet your enterprise security needs built-in data and AI governance



Amazon SageMaker Unified Studio (preview)

Data Processing

SQL Analytics

Model Development

Gen AI APP Development

Streaming

coming soon

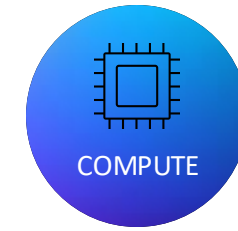
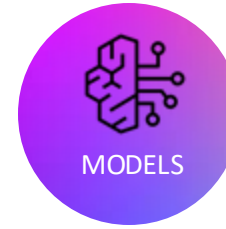
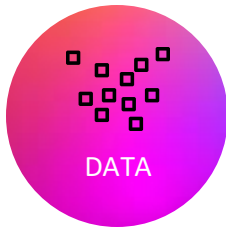
Search

coming soon

Business Intelligence

coming soon

Seamless access to all data, all resources, and all tools



JUPYTER NOTEBOOKS



SQL EDITOR

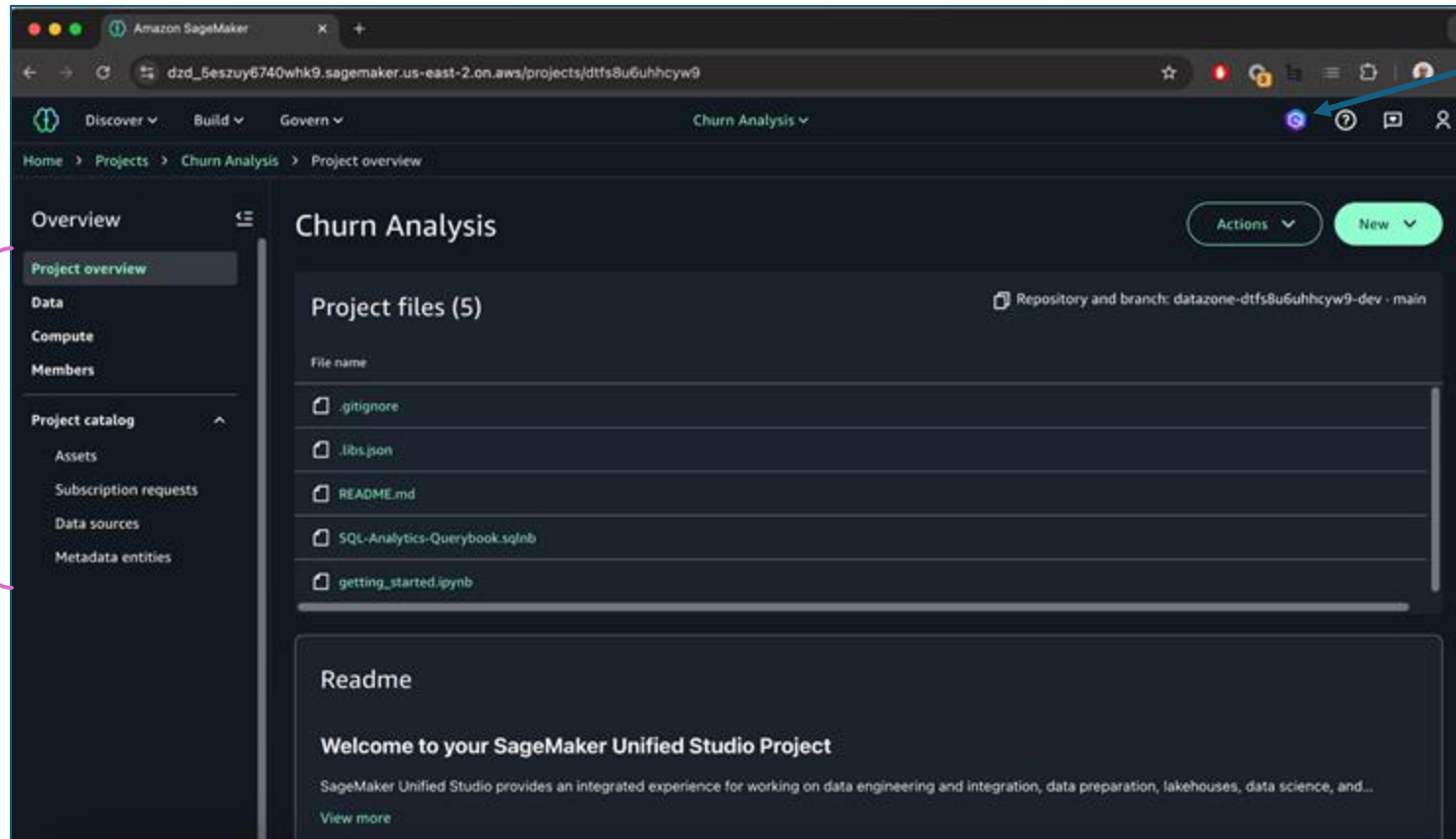


BEDROCK IDE
(preview)

SageMaker Unified Studio (preview)

AN INTEGRATED EXPERIENCE FOR ALL YOUR DATA AND AI

See the [code](#),
[data](#), [ML](#), and
[compute](#) for your
projects in [one](#)
[view](#)



Gen AI assisted
experience powered
by [Amazon Q](#)

Work with
[notebooks](#),
[queries](#), [models](#),
and more from
[familiar AWS](#)
[tools](#)



Amazon SageMaker Unified Studio (preview)



Healthcare scenario: Accelerating Precision Medicine Research

Data Integration:

Unify genomic datasets, clinical trial results, and patient records using SageMaker Lakehouse, enabling comprehensive access from a single interface

Collaborative Research:

Foster seamless collaboration among bioinformaticians, data scientists, and clinicians through the unified studio environment.

Advanced Analytics and AI:

Leverage built-in SQL editor for complex queries and develop ML models to predict drug responses based on genetic profiles.

Generative AI Applications:

Create custom AI assistants using Bedrock IDE to help clinicians interpret genomic reports and suggest treatment options.

Enhanced Security:

Implement fine-grained access controls and data lineage tracking to protect sensitive patient data and comply with healthcare regulations.

AI-Assisted Development:

Utilize Amazon Q Developer to accelerate research tasks, such as generating complex SQL queries and optimizing ML models for genomic data analysis.

SageMaker AI – Build and Evaluate

SINGLE DEVELOPMENT ENVIRONMENT TO USE ALL YOUR DATA AND TOOLS FOR ANALYTICS AND AI

SageMaker AI



Unified **end-to-end ML lifecycle** for data prep, model build, training, and hosting

Access team data in shared in your Maxdome domain and project

Build ML models with Integrated Development Environment

Generate code suggestions, **detect** security and code quality issues with Amazon Q

Managed MLFlow, Model Registry, and interactive Pipelines

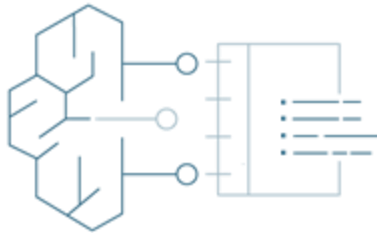
Optimized for popular deep learning (DL) frameworks such as TensorFlow, PyTorch, and Hugging Face

Amazon SageMaker Studio Lab

A JUPYTER NOTEBOOK SERVICE TO HELP CUSTOMERS MASTER THEIR SKILLS

Amazon SageMaker Studio Lab

A no-charge, no-configuration
service that enable data scientists
to learn and experiment with
machine learning



<https://studiolab.sagemaker.aws/>

Create an account with an email address – free

No setup or configuration required

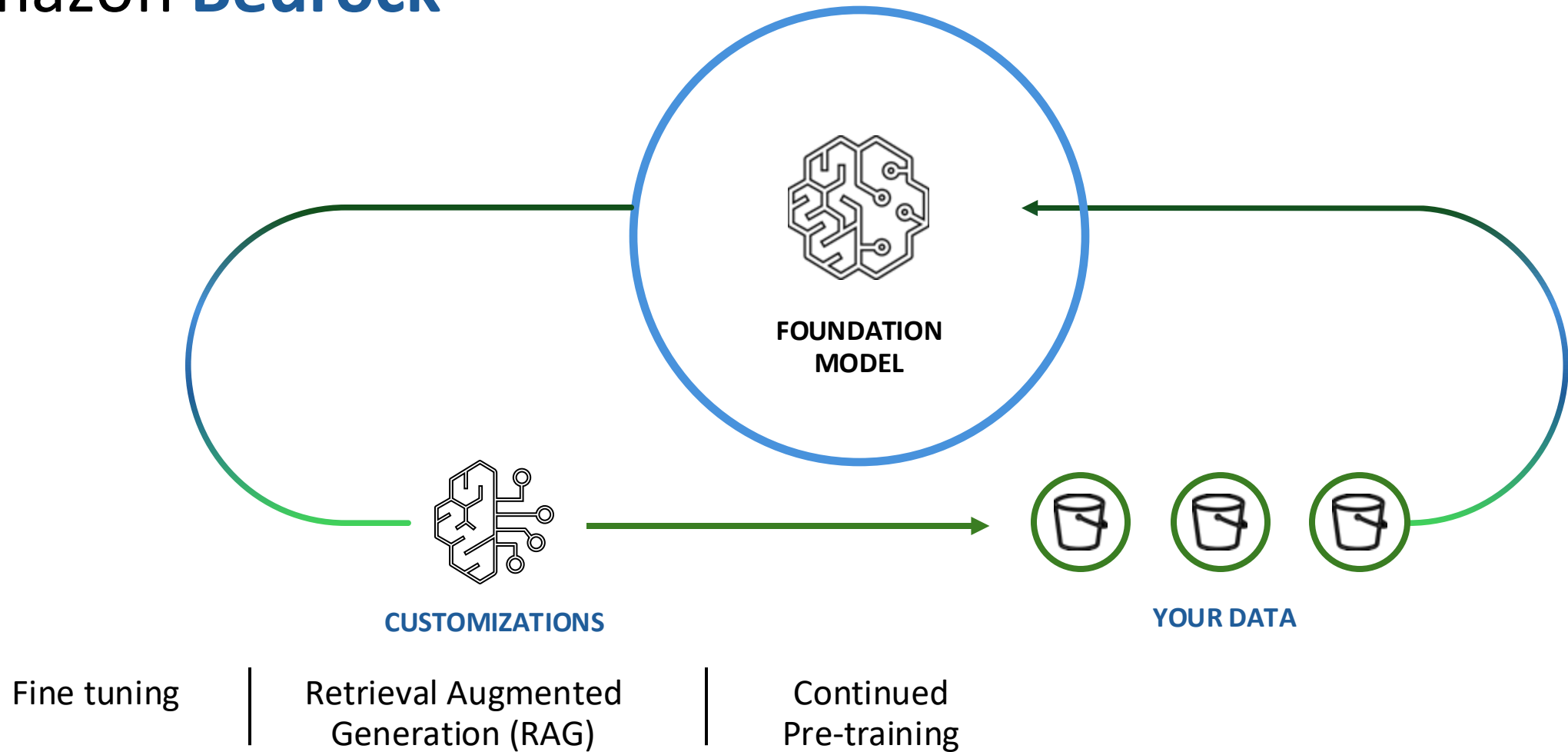
15 GBs to save your work projects.

As many compute sessions as you need –
CPU (12 hrs)/GPU (4 hrs)

Access any notebook on GitHub

Migrate to SageMaker Studio when ready

Amazon Bedrock



Amazon Bedrock

Effective reasoning & rapid analysis for long context windows

JAMBA

Frontier multimodal intelligence at low-latency, Agent & RAG Applications, high-quality image & video generation

AMAZON NOVA

Advanced reasoning & coding capabilities, including computer use skills

CLAUDE

Multimodal search & advanced retrieval powering multilingual knowledge agents

COMMAND
EMBED
RERANK

High-quality video generation from text & images

LUMA RAY 2

Advanced image & language reasoning

LLAMA

Knowledge summarization, expert agents, & code completion

MISTRAL
MIXTRAL

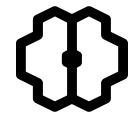
Software engineering AI for large enterprises

MALIBU
POINT

High-quality AI image generation, easily deployable at scale

STABLE DIFFUSION
STABLE IMAGE

Hands-on Demo



Amazon SageMaker

[PLACEHOLDER – Case Studies]



Researchers from the Allen Institute for Brain Science

Photo by Erik Dinnel, Allen Institute