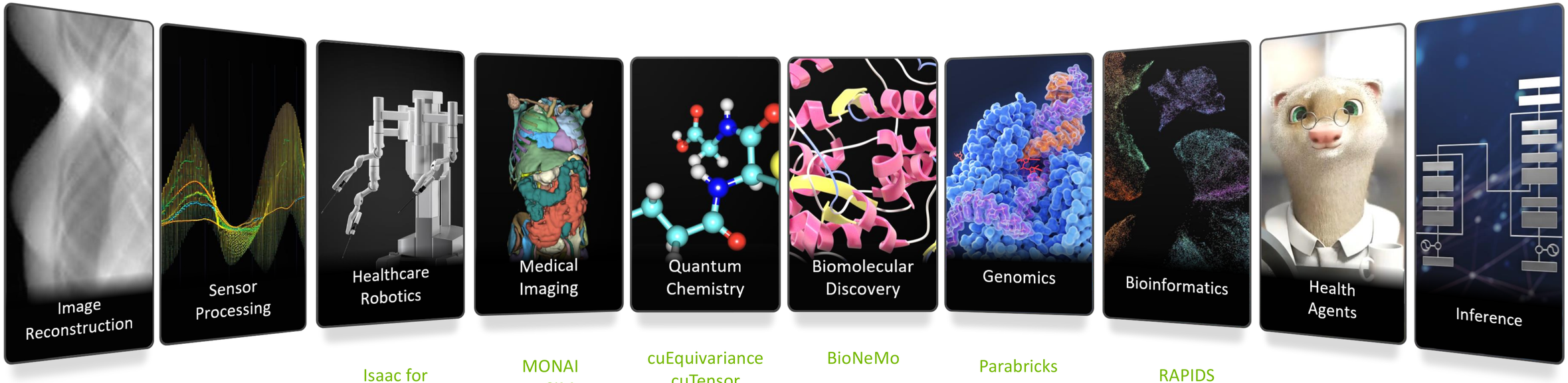
Healthcare and Life Sciences

Partner Deck

NVIDIA for Healthcare and Life Sciences Overview

NVIDIA is Accelerating Healthcare Breakthroughs



cuBLAS
cuFFT
NPP

Holoscan

Isaac for Healthcare

MONAI
cuCIM

cuEquivariance
cuTensor

BioNeMo

Parabricks

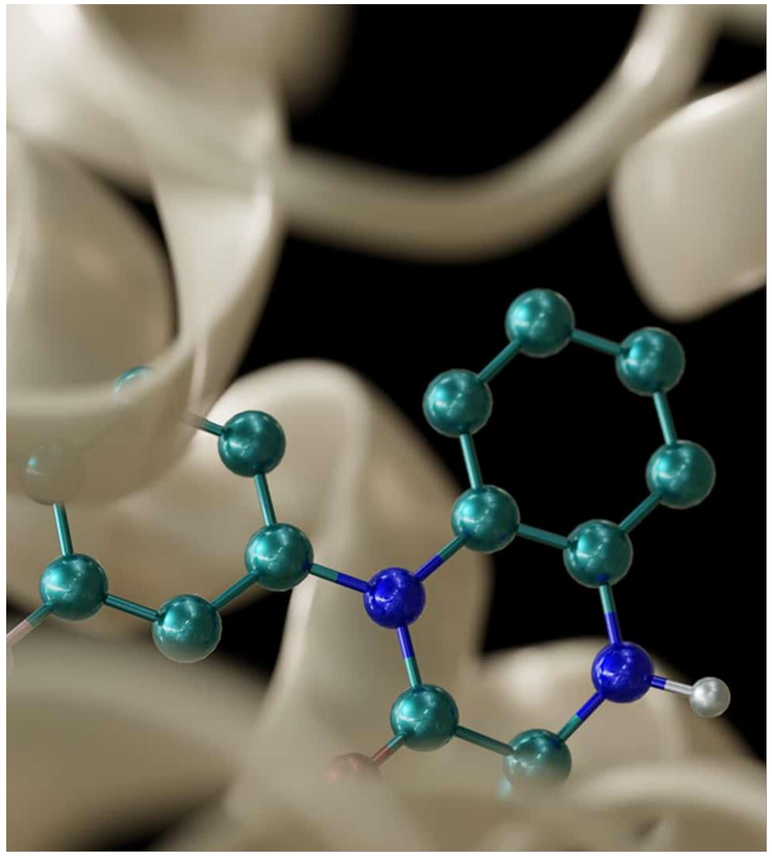
RAPIDS
MSA-Search

RIVA
NeMo
ACE

TensorRT-LLM
NCCL
Dynamo

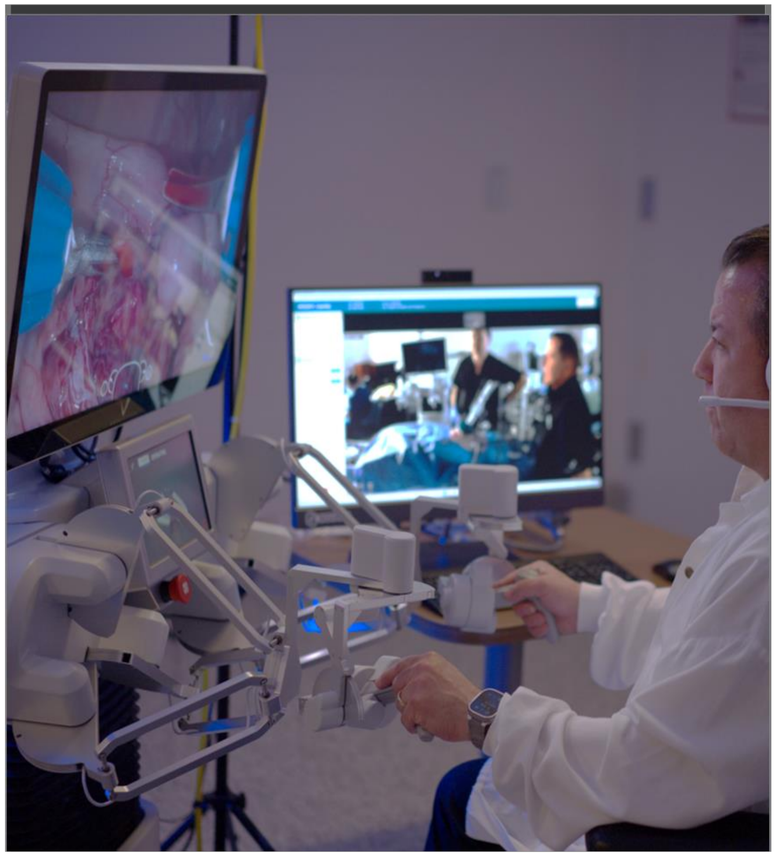
NVIDIA HCLS Focuses

Tools to build next gen digital robots & agents



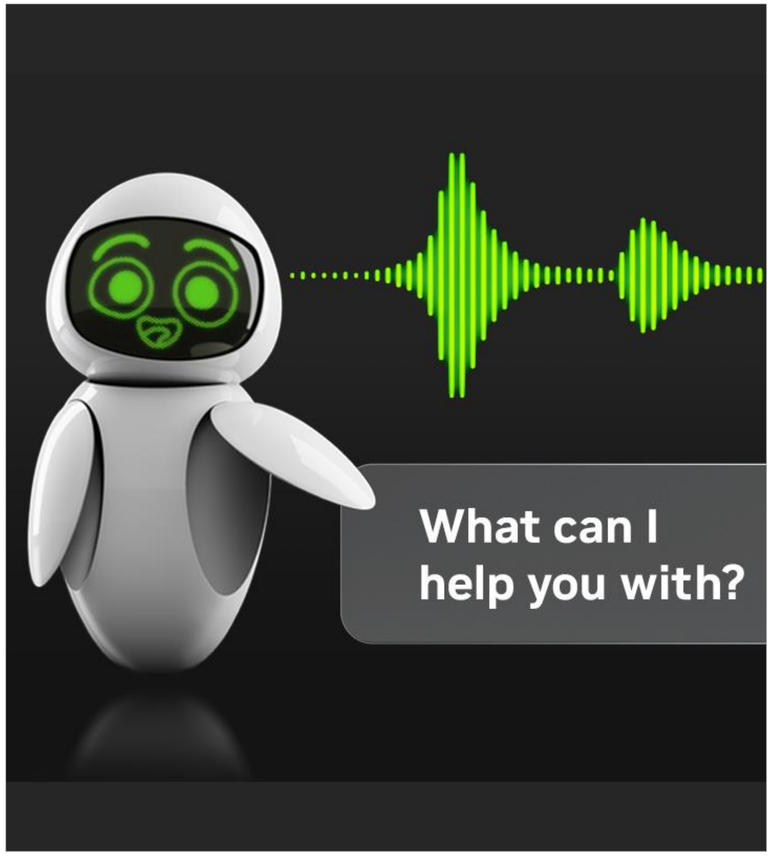
Digital Biology

Early Discovery
Clinical Development
Labs of the Future



Digital Devices

Physical Robots
Surgical, assistive, delivery
Medical Imaging AI



Digital Health

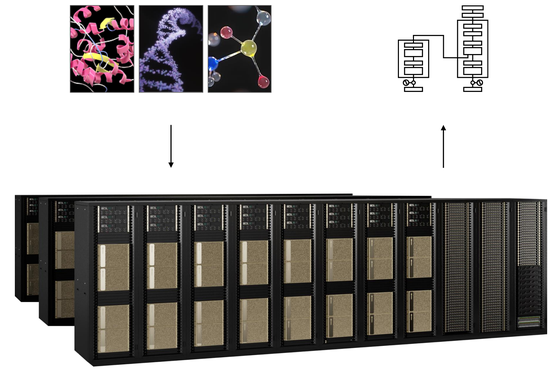
Physician/Patient Engagement
Digital humans

Digital Biology

NVIDIA for BioPharma

Drug Discovery Is at an Inflection Point

Computer Aided Drug Discovery is Expanding Exponentially



CHARMM
DFT & Force Fields
X-Ray Protein Structures

Large Scale
Simulation
High Throughput Screening

Virtual
Screening
Genomics

Multi-System
Simulation
Cryo-Electron Microscopy

AlphaFold
AI Structure Prediction
Multi-Scale Omics

1980 1990 2000 2010 2020

BioNeMo Accelerates Drug Discovery with Generative AI

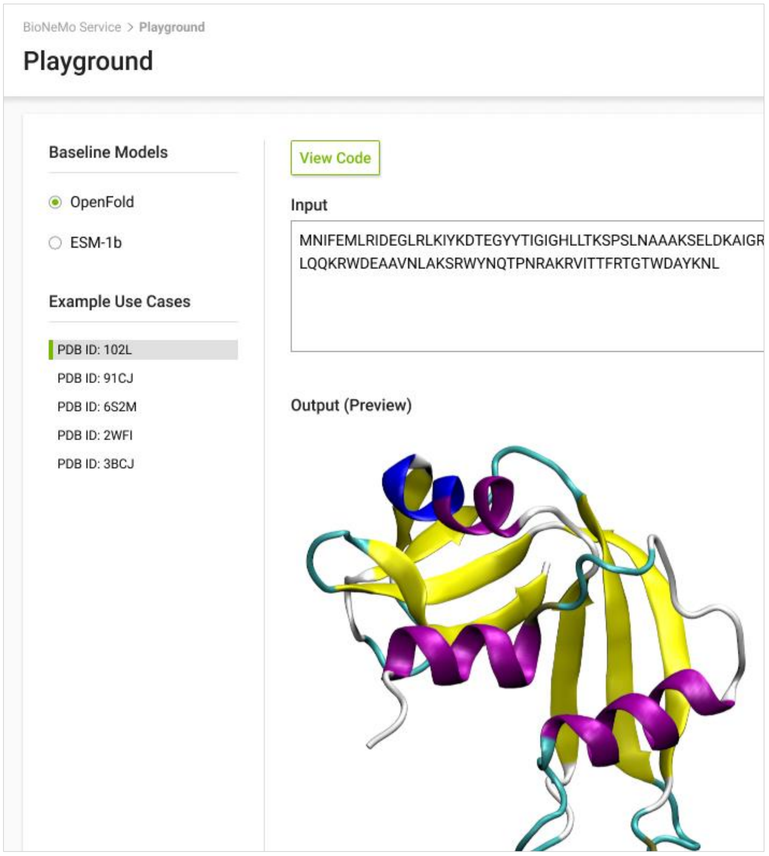
Build foundation models | Customize SOTA models | Run optimized models

Customizable SOTA Generative AI

Innovate faster and more competitively using your proprietary datasets to train and fine-tune drug discovery workflows

Easy & Instant Access to Optimized AI

Eliminate the need for building IT infrastructure, managing open source software, optimize for throughput

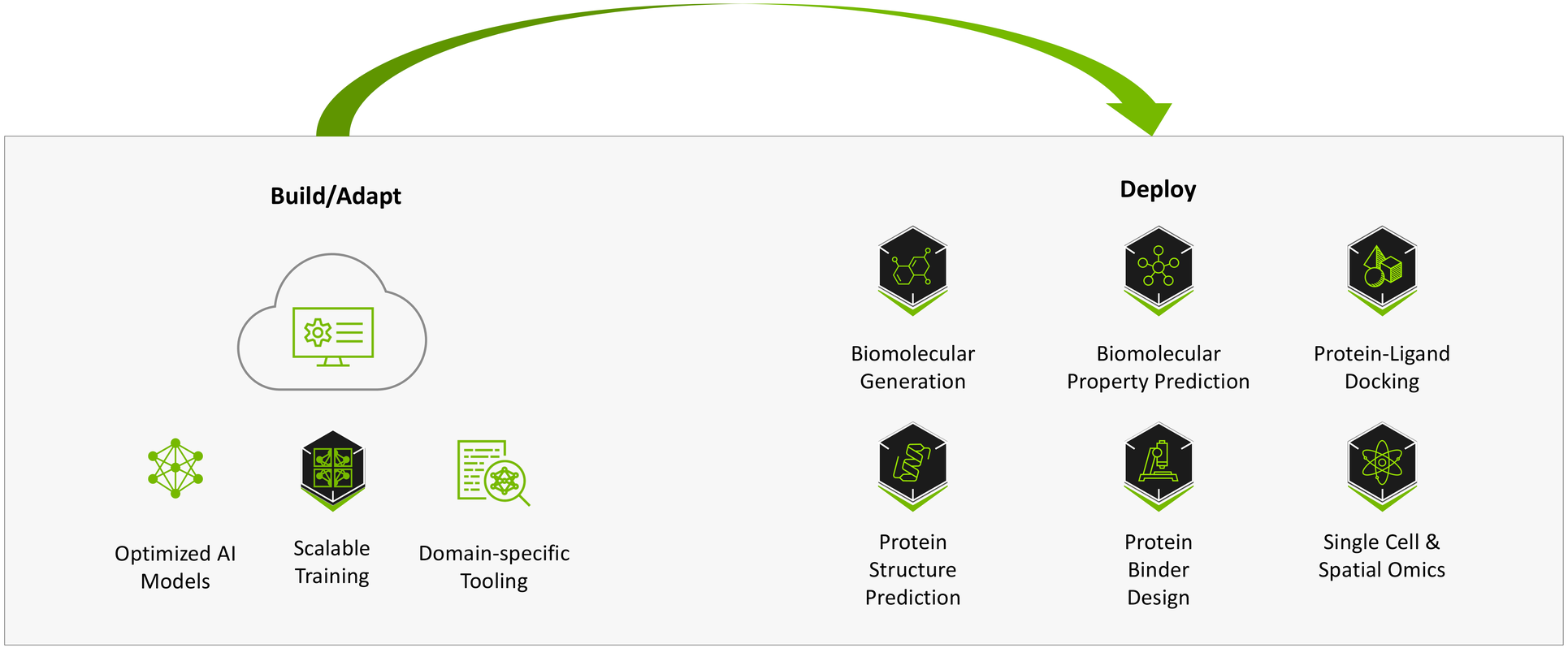


Seamless & Scalable AI Microservices

Ultimate flexibility in experimenting and building enterprise grade generative AI workflows with GUI & API endpoints

What is NVIDIA BioNeMo?

Build, adapt and deploy AI models for computer-aided drug discovery



BioNeMo Framework

Open-Source | NVIDIA AI Enterprise

BioNeMo NIMs

Developer Program | NVIDIA AI Enterprise

NVIDIA DGX Cloud

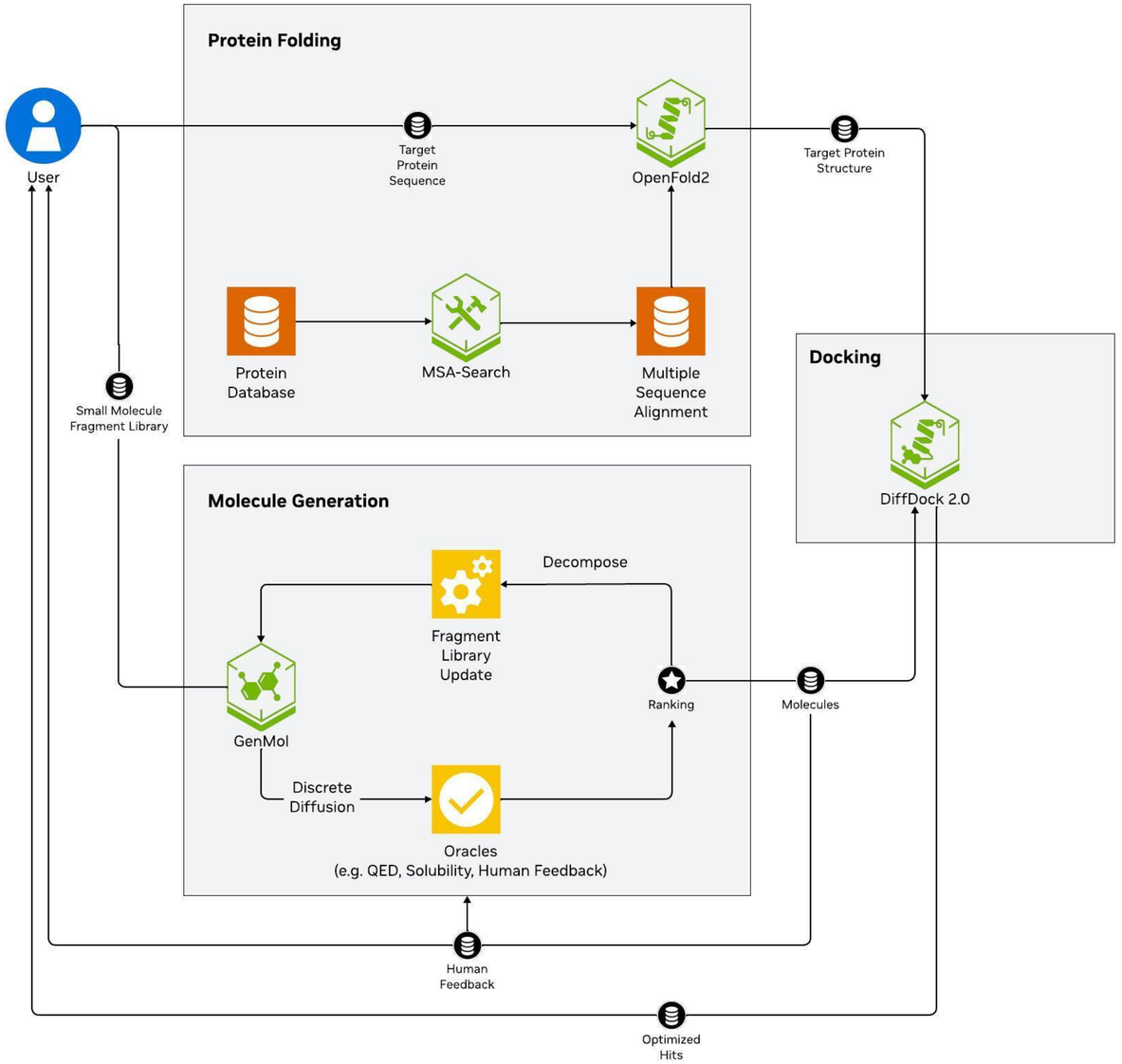
Microsoft Azure aws Google Cloud ORACLE

BioNeMo Blueprints: Generative Virtual Screening

Models: MSA-Search, AlphaFold2, GenMol, DiffDock

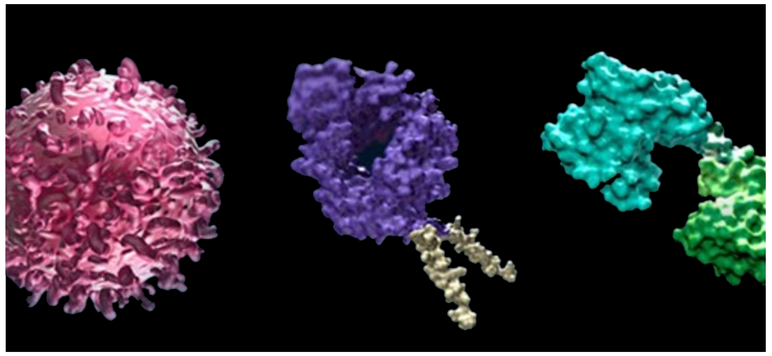
Benefits

- Use generative AI to more efficiently explore chemical space to optimize molecular designs for multiple features simultaneously
- Accelerated NIMs allow rapid evaluation of large molecule databases to identify better drug candidates faster
- Test fewer molecules to identify virtual hits, reducing the time and cost of drug development



Leaders in Drug Discovery & Development use NVIDIA

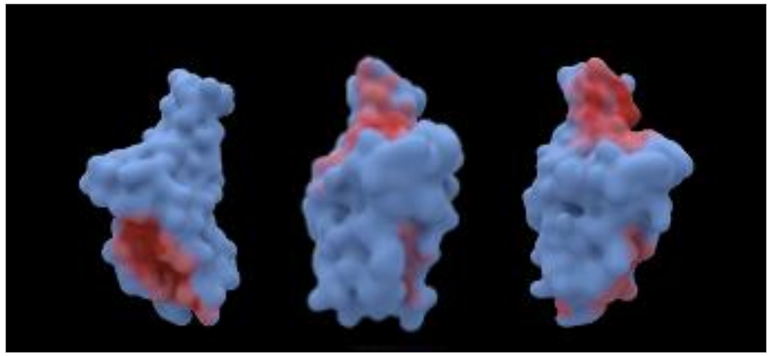
Leading pharmaceutical companies, startups, and medical centers



Amgen

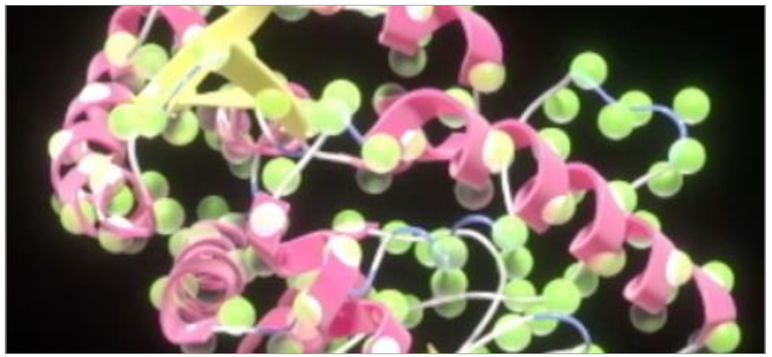
5-100x Faster Structure Prediction with BioNeMo

15-100x faster training with proprietary data with BioNeMo on DGX Cloud



Deloitte

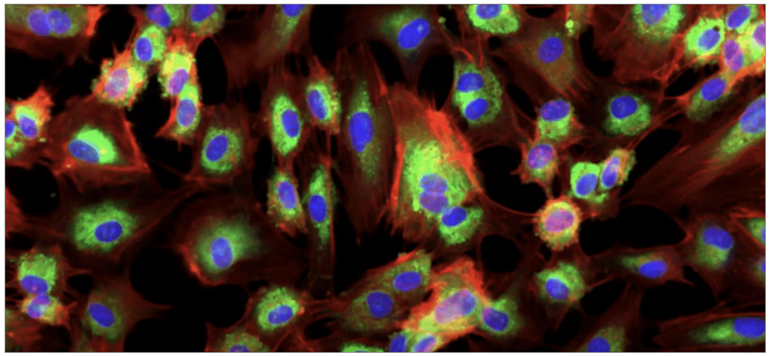
Intelligent Structural Biology Pipeline integrating BioNeMo



Evozyne

167 Mutations Generated in 1 wk. using BioNeMo

Generated novel proteins for rare disease & climate change

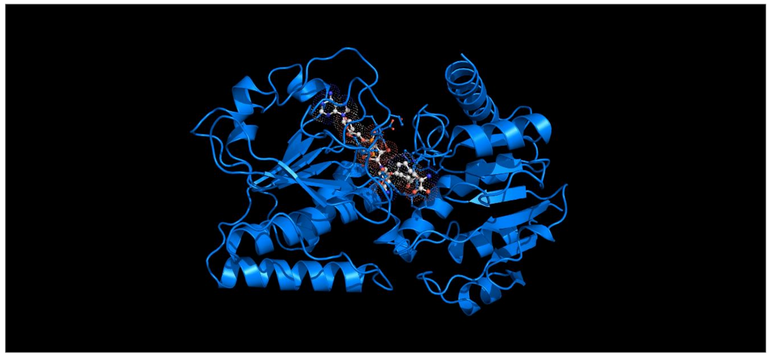


Recursion Pharmaceuticals

Phenom-Beta: Vision transformer model targeting cellular data

BioHive-1 Supercomputer with NVIDIA DGX

500 NVIDIA H100 TensorCore GPUs

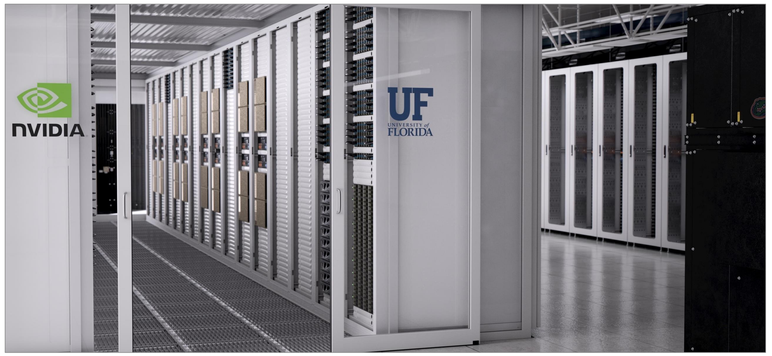


Iambic

NeuralPlexer: 3D prediction of protein-ligand complexes

Takes protein structure predictions from months to minutes

NVIDIA A100 and A10G Tensor Core GPUs



Univ. Florida Health System

Clinical Language Models, Synthetic Clinical Data Generation

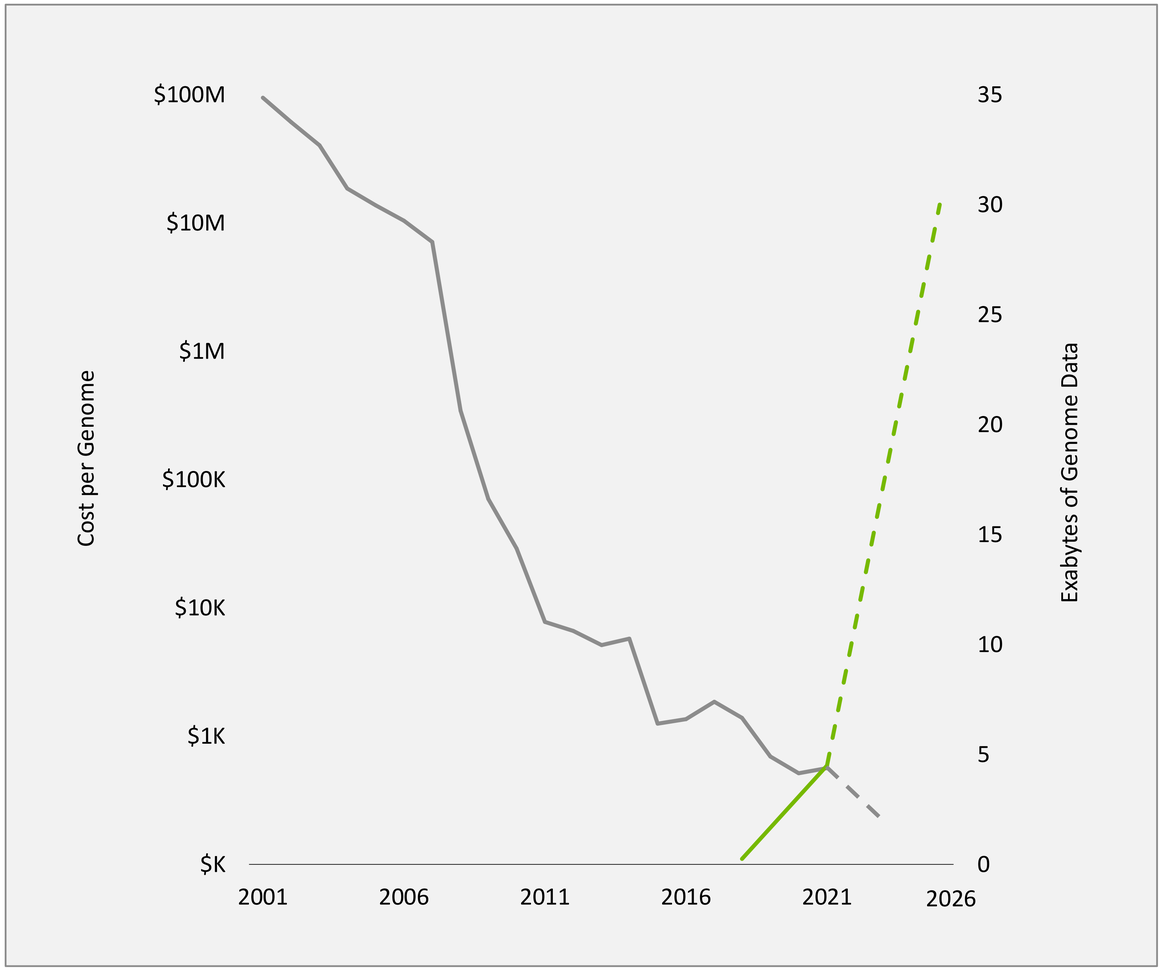
DGX SuperPod

Digital Biology

NVIDIA for Genomics

Genomics Projects Will Exceed 40 Exabytes in the Next Decade

As sequencing becomes less expensive, the data deluge grows



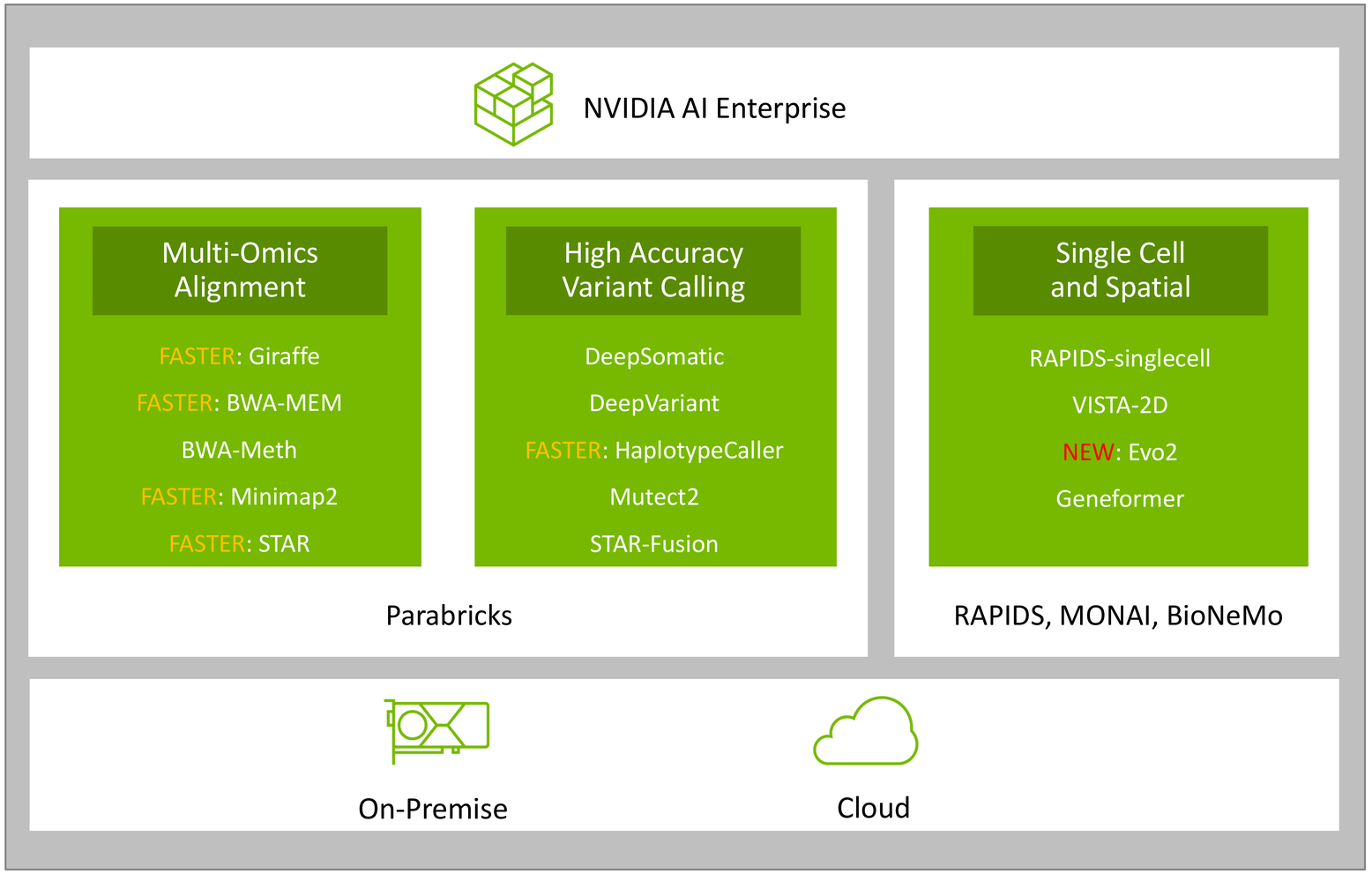
"Our ability to sequence DNA has far outpaced our ability to decipher the information it contains, so genomic data science will be a vibrant field of research for many years to come."

National Human Genome Research Institute

Source: https://www.genome.gov/about-genomics/fact-sheets/Genomic-Data-Science

The AI & GPU-Accelerated Software Suite for Omics Analysis

Higher Accuracy, Higher Speed, Lower Cost



Increase Speed

Experience **135x** faster analysis of WGS compared to CPU-only

Reduce Cost

Up to **50% lower** compute cost for WGS compared to CPU-only

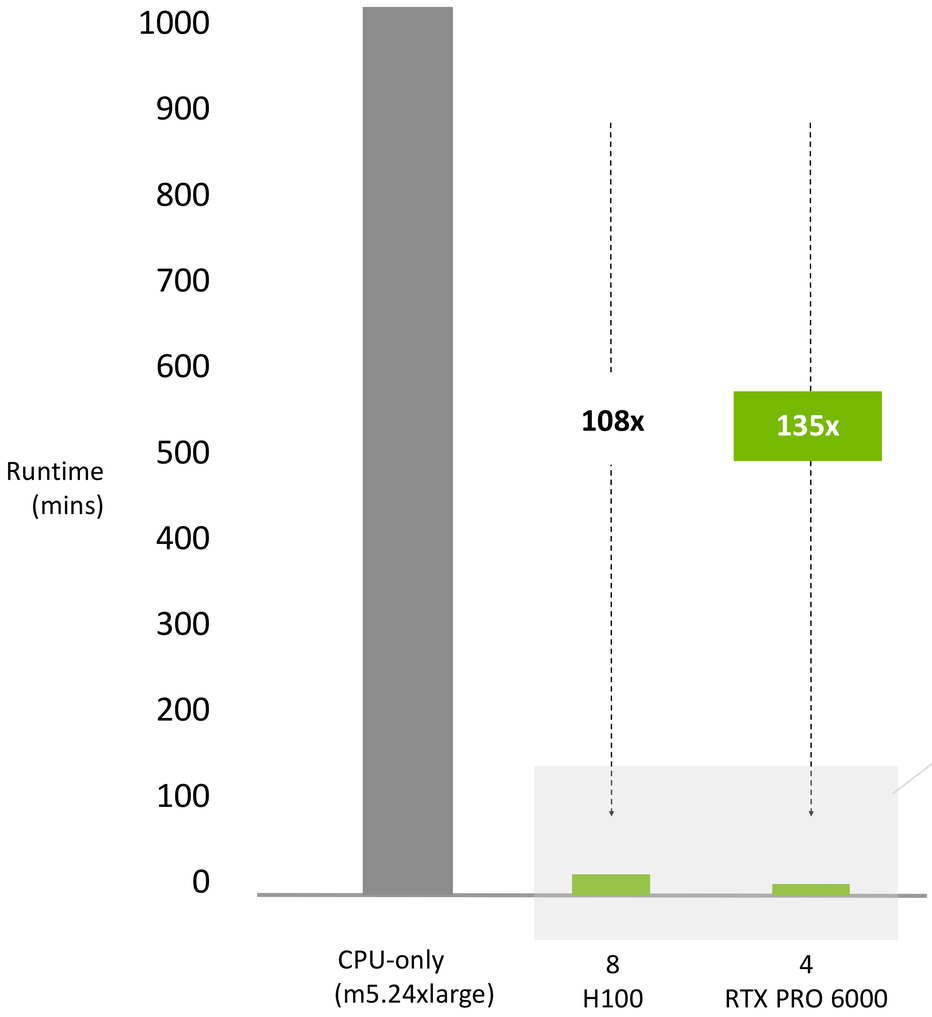
Boost Accuracy

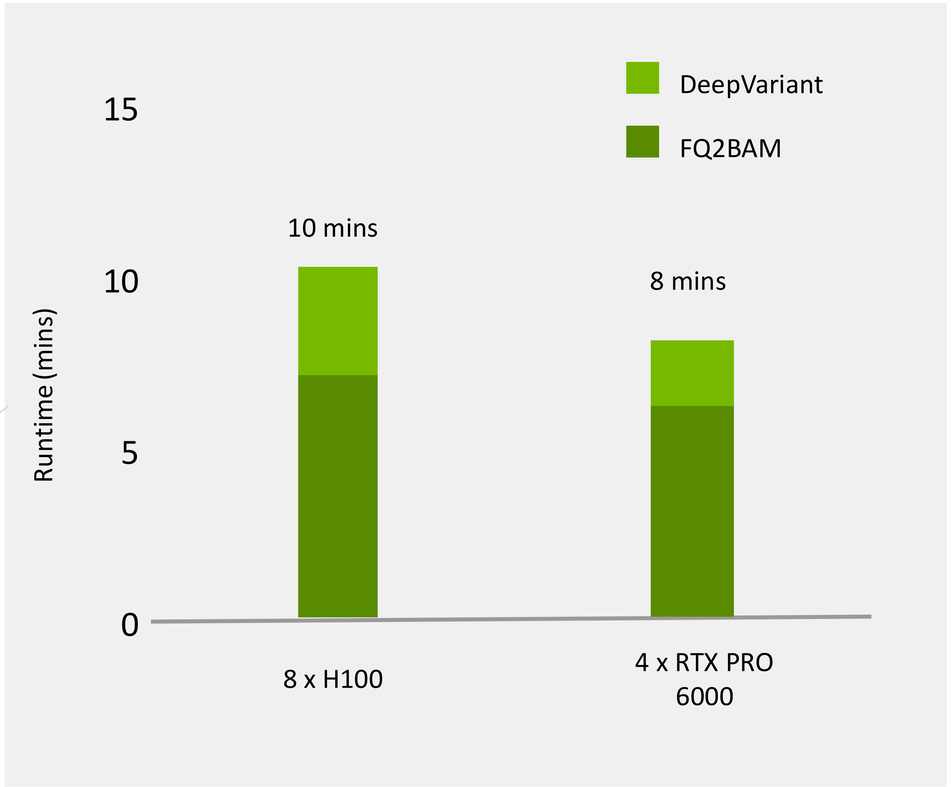
High accuracy deep learning and pangenome alignment

Higher Speed: Germline Analysis from 18 hours to 8 minutes

135x acceleration using RTX PRO 6000

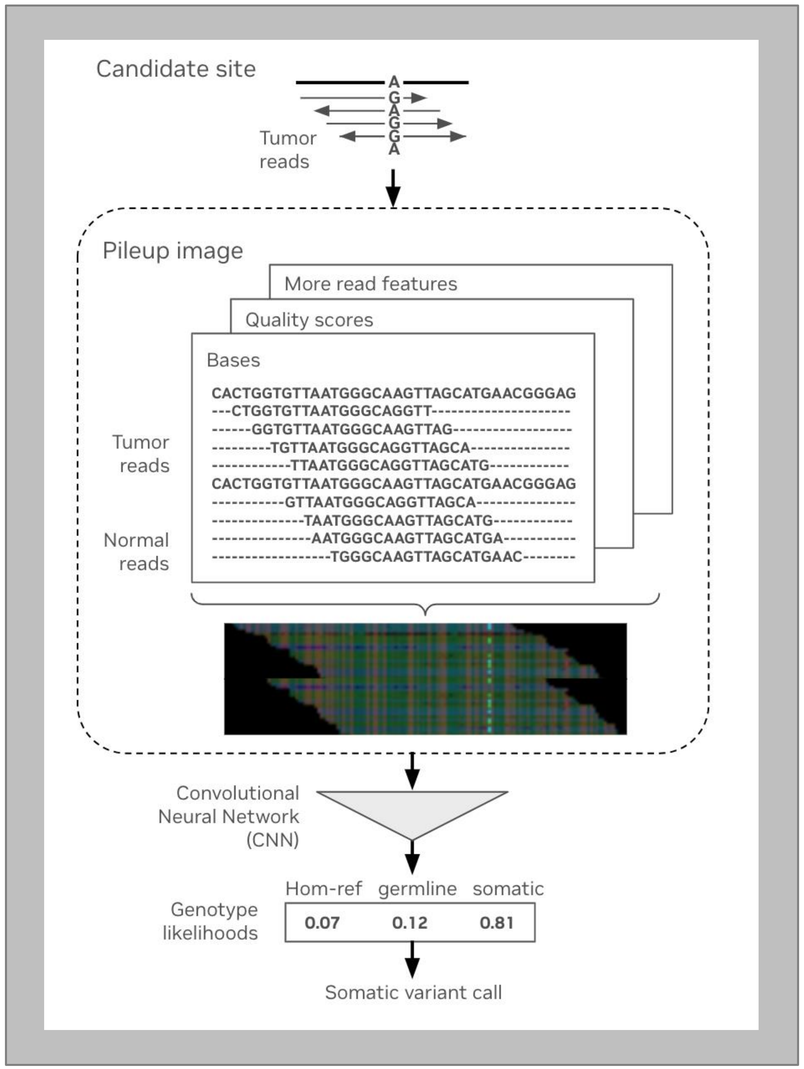
Germline workflow runtime per whole genome
(HG002, 30x Illumina)





DeepSomatic: Unlock Deeper Insights of Somatic Mutations

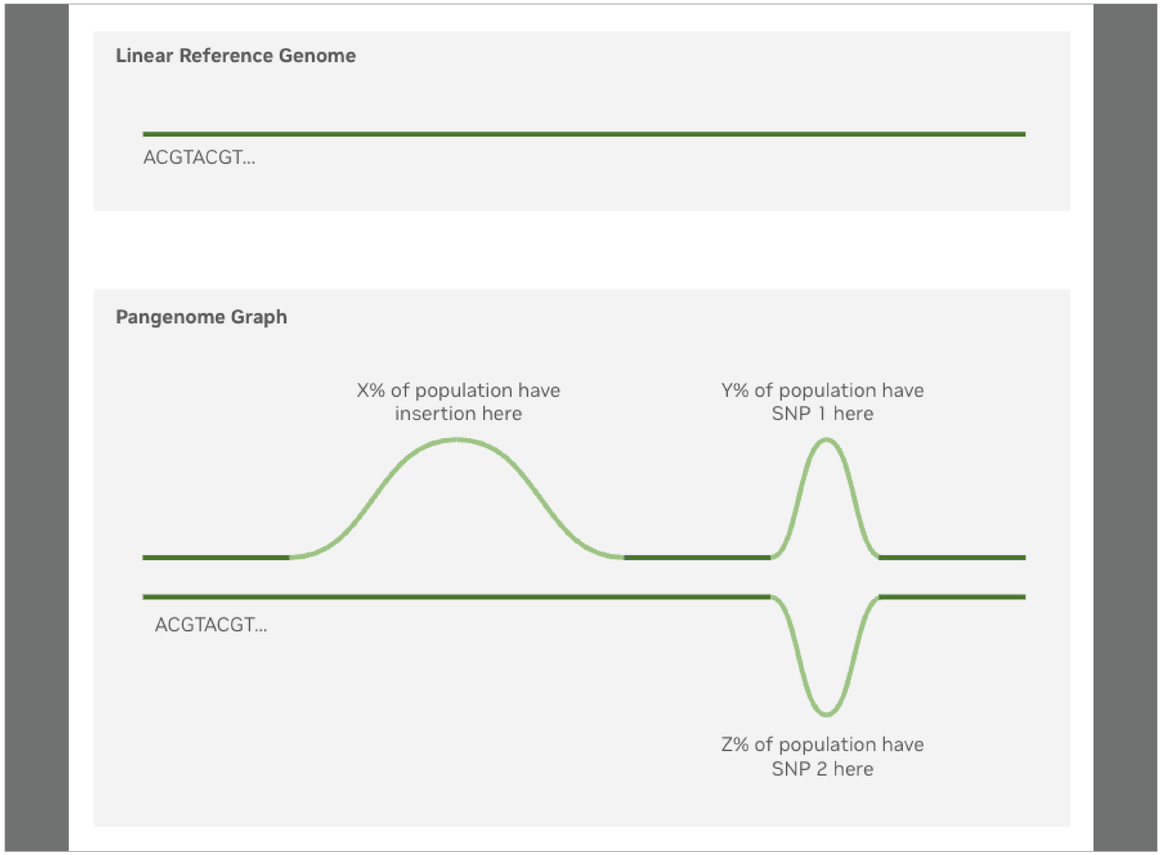
Parabricks 4.3.1 now supports Google's DeepSomatic



- **Leverage deep learning** to analyze cancer samples with Google's DeepSomatic
- Gain new functionality for **variant calling in somatic data**
- **Access an easy-to-use, accelerated** version of DeepSomatic with Parabricks 4.3.1

Accelerate Pangenome Alignment with Giraffe

Parabricks v4.4 now supports UCSC's Giraffe



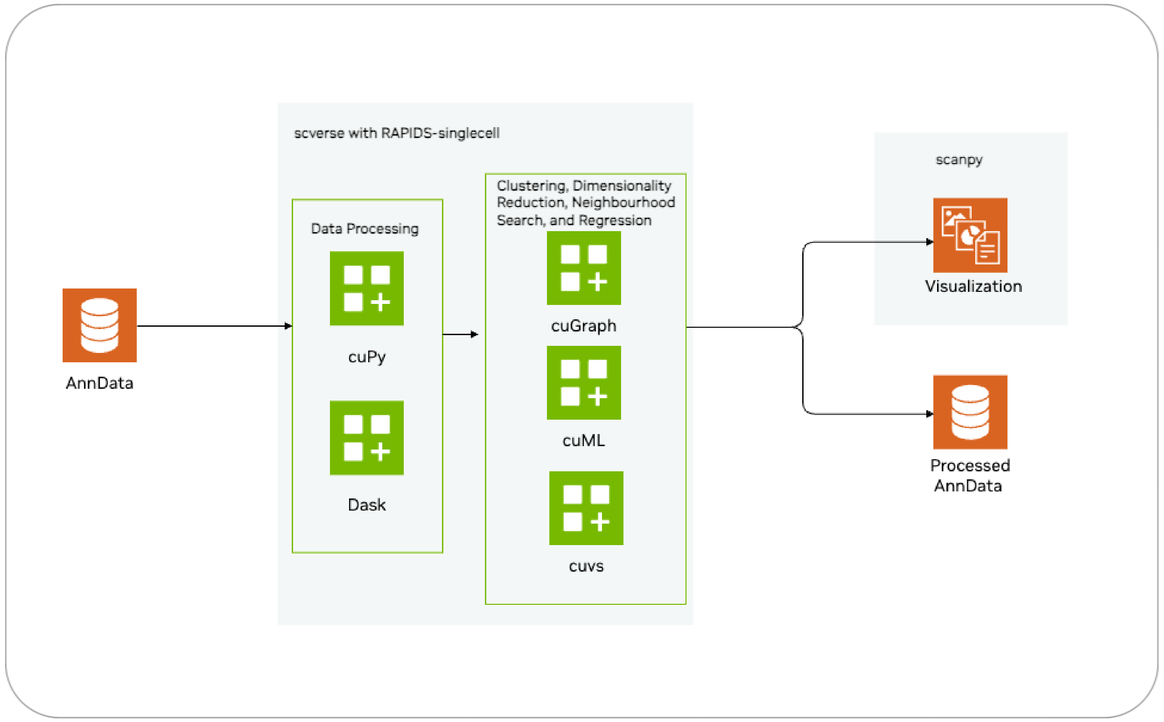
- Increase accuracy and improve variant calling—particularly across genetic variations and diverse populations
- GPU-accelerated Giraffe with single-end and pair-end support
- Equivalent results to open-source version of Giraffe

Easily Deploy NVIDIA AI Blueprints for Single-Cell and Genomics Analysis

Introducing single-cell and genomics solutions with RAPIDS and Parabricks

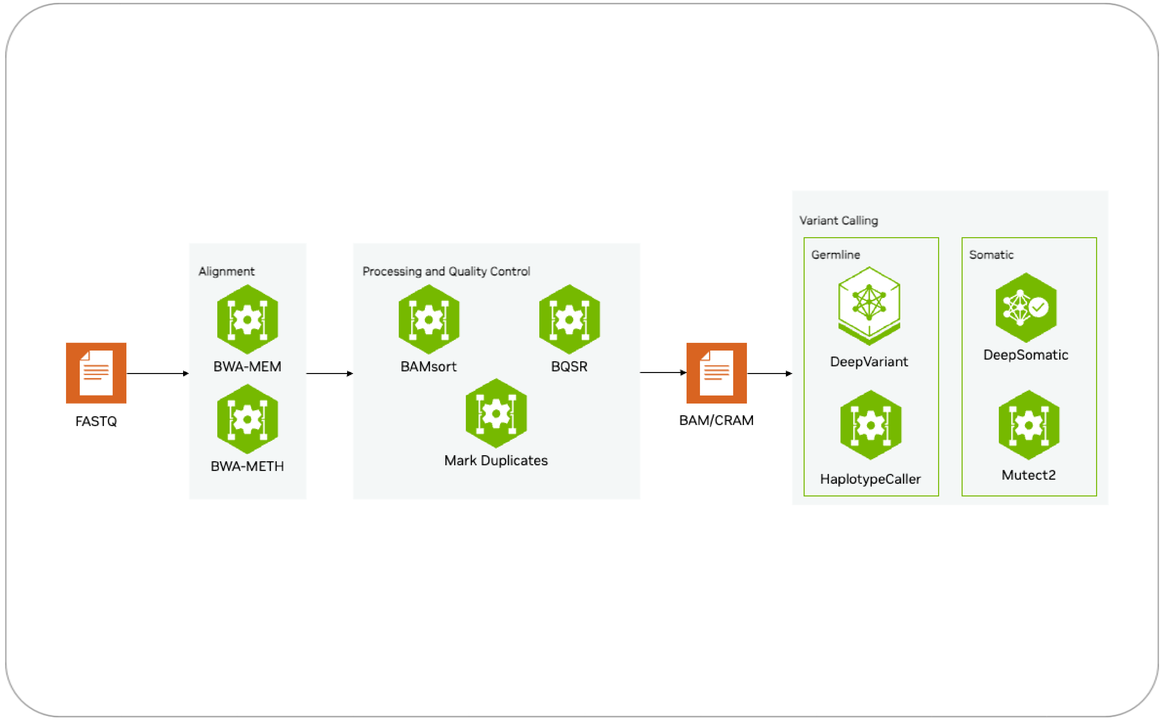
Single-Cell Analysis

Test near-real time data with RAPIDS-singlecell developed by scverse



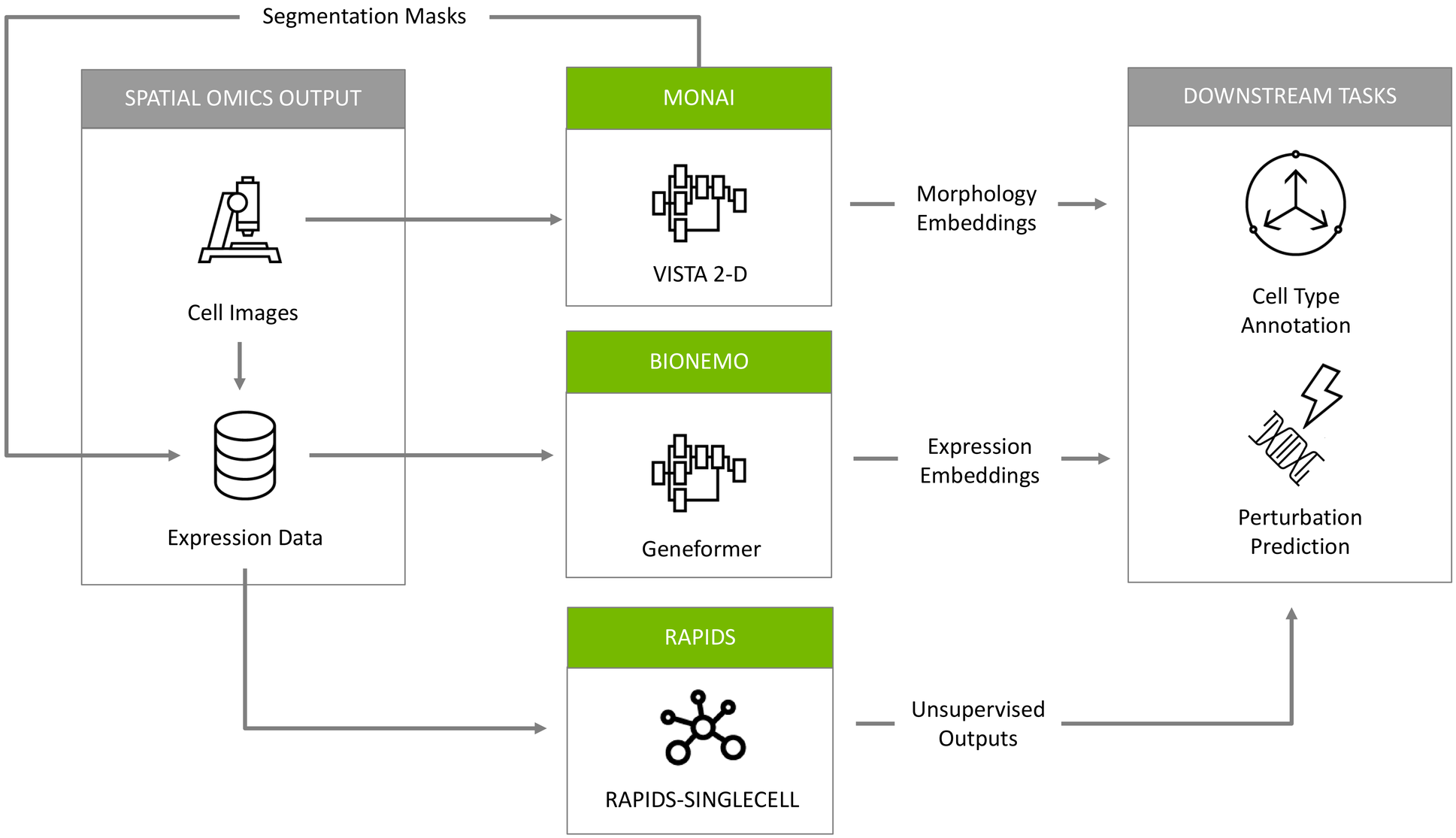
Genomics Analysis

Leverage Parabricks FQ2BAM and DeepVariant for whole exome analysis on short reads



AI-Powered Single Cell & Spatial Omics

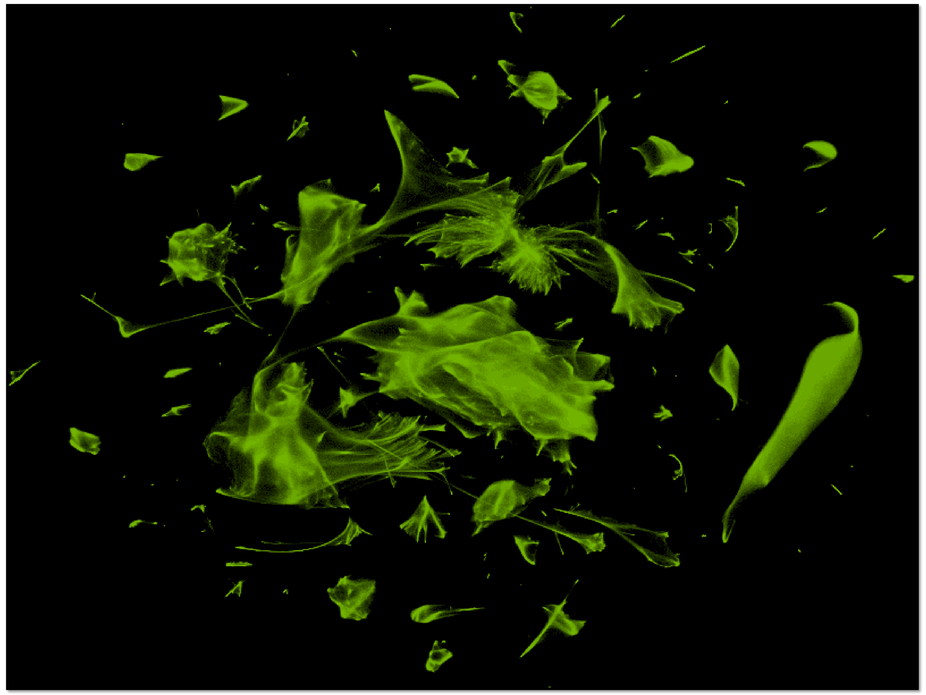
Build foundation models | Segment at high accuracy | Extract morphology embeddings



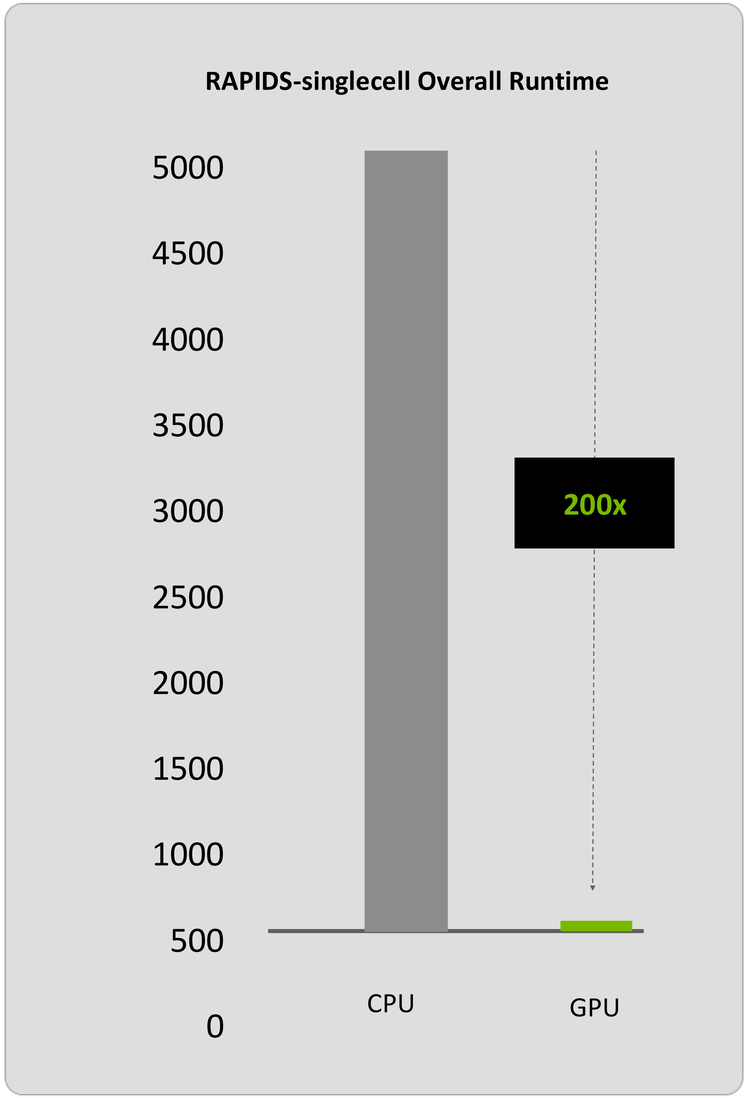
Analyze Orders of Magnitude More Data with RAPIDS-singlecell

Validate in real cells to enable scientific exploration and unlock biological insights

RAPIDS-singlecell
Introduces GPU-optimized versions of the
ScanPy library functions.

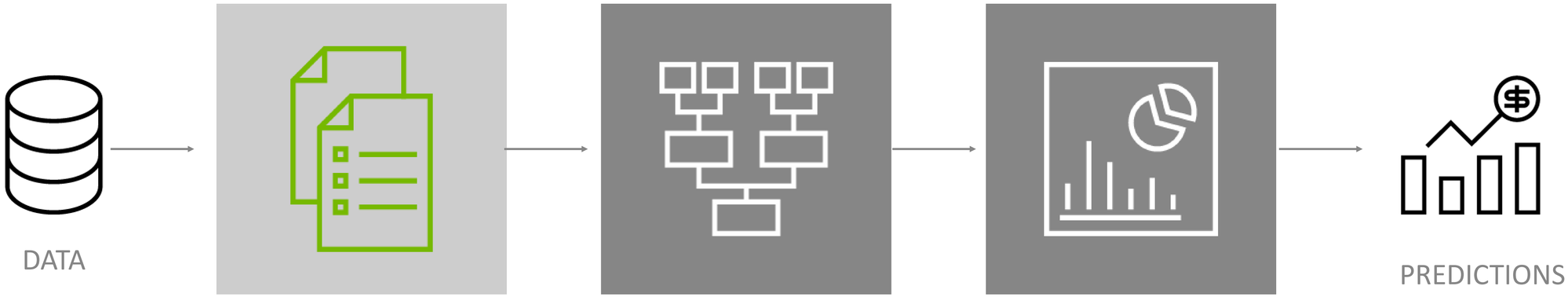


1 Million Cell Dataset
676x faster UMAP and **70x** faster PCA



RAPIDS-singlecell developed by the scverse

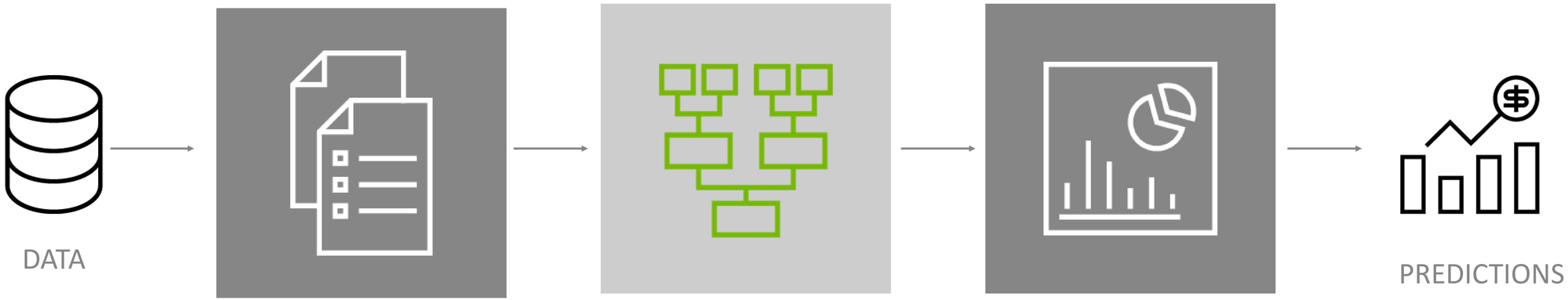
GPU-ACCELERATED DATA SCIENCE WORKFLOW WITH RAPIDS



DATA PREPARATION

- GPUs accelerated compute for in-memory data preparation
- Simplified implementation using familiar data science tools
- RAPIDS is a Pythonic drop-in replacement for pandas built on CUDA C++
- GPU-accelerated Spark

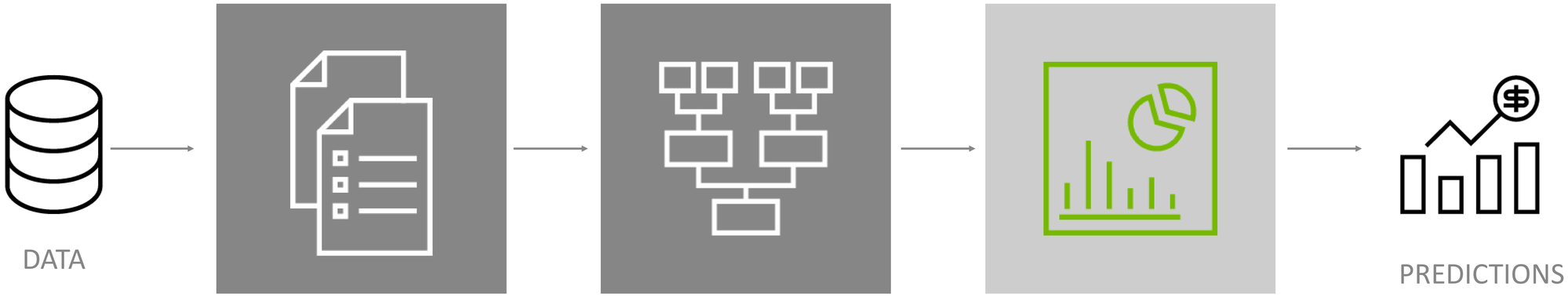
GPU-ACCELERATED DATA SCIENCE WORKFLOW WITH RAPIDS



MODEL TRAINING

- GPU-acceleration of today's most popular ML algorithms
- **XGBoost and Random Forest**
- RAPIDS accelerated ML algorithms like UMAP, PCA, K-means, k-NN, DBScan, tSVD, and more
- Easy-to-adopt, scikit-learn like interface

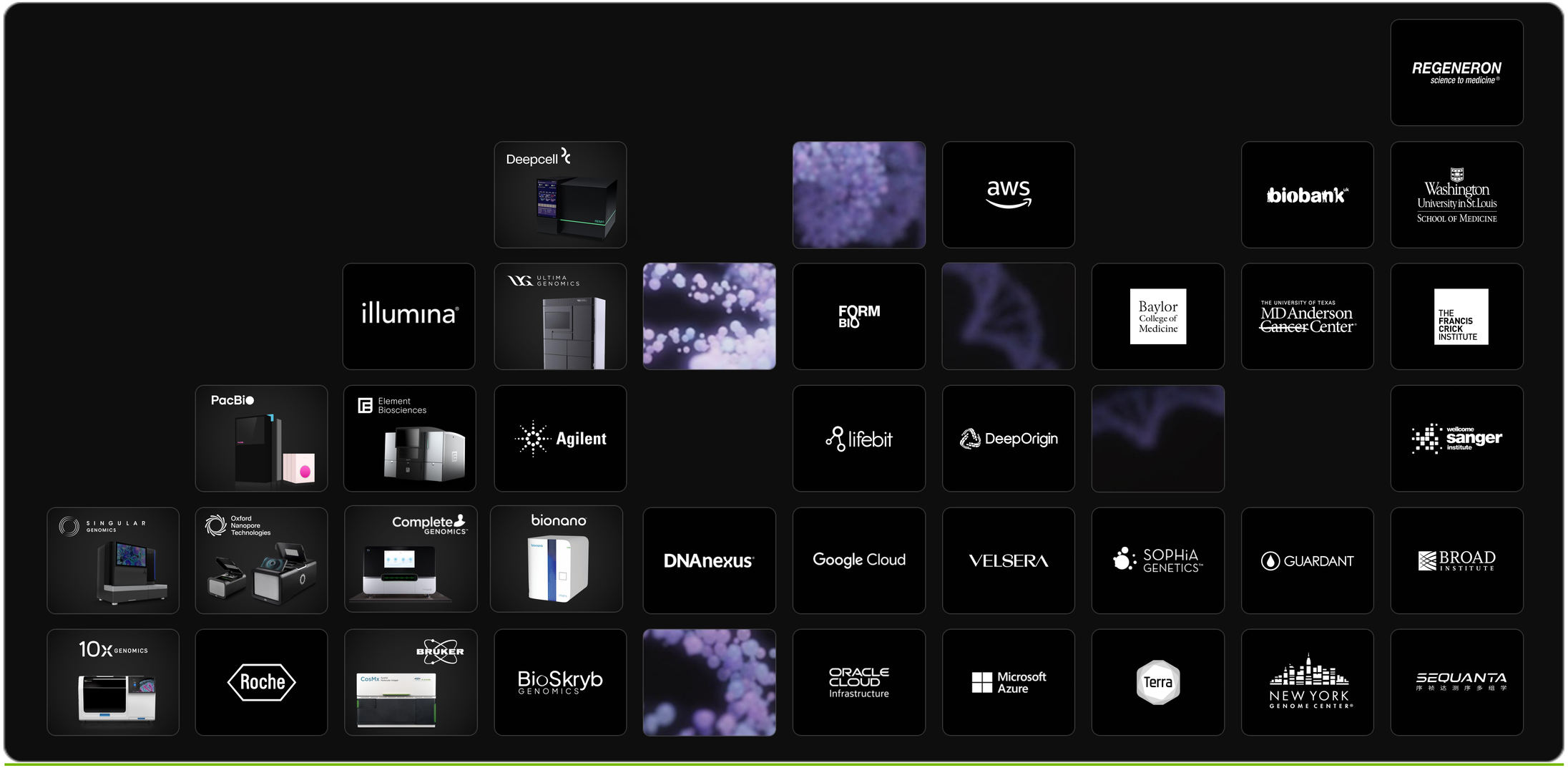
GPU-ACCELERATED DATA SCIENCE WORKFLOW WITH RAPIDS



VISUALIZATION

- Effortless exploration of datasets, billions of records in milliseconds
- Dynamic interaction with data = faster ML model development
- Integration with data visualization ecosystem leaders like Bokeh, Datashader, Plotly, and more

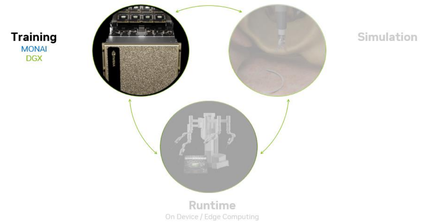
NVIDIA Genomics Ecosystem



Instruments

ISVs / Cloud Platforms

Industry and Research



AI Training for MedTech

Build, customize, and deploy generative AI models for MedTech

Training & Customization

Model Training

Data Prep

Customer Data Sources

Pretrained Models

SDKs → Application frameworks & NIMs

NV AI Enterprise → Platform software

ML Ops software → Ensures high utilization, job orchestration

Infrastructure hardware & networking → Provides the necessary compute

Deployment

World Leading Medical AI Platform

The 1st Computer in NVIDIA's 3-Computer Solution

6.5M
Downloads

4000
Github Projects

286
Contributors

4300
Papers

40
Models

18
Competitions Won

aws · Bayer · Capgemini · Centaur Labs · CLEAR ML · data iku · Flywheel · Google Cloud · GSK · Innolitics · kitware · Mark III Systems · MathWorks · Microsoft Azure · Mount Sinai · ORACLE CLOUD Infrastructure · quantiphi Solving What Matters · RADICAL IMAGING · RHINO HEALTH · V7 · VINBRAIN · Weights & Biases

NVIDIA

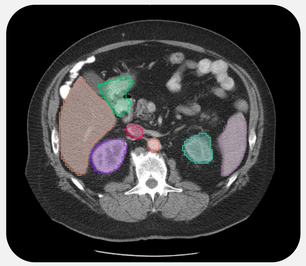
MONAI Framework and Foundational Models

Accelerate medical imaging breakthroughs

MONAI is an open-source, domain-specific Medical AI framework that accelerates medical imaging breakthroughs. MONAI provides tools for training and deploying AI models into clinical production.

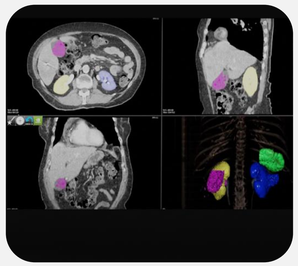
MONAI Label

Interactive fine-tuning of models



MONAI Core

Robust AI model training



MONAI Deploy

Seamless deployment in clinical environments

MONAI Model Zoo

featuring a diverse collection of pre-trained models (30+)

MONAI Foundation Models

VISTA-3D NIM

Interactive 3D segmentation and annotation

MAISI NIM

High-quality synthetic 3D CT image generation

VISTA-2D

Cell segmentation and morphology analysis

VILA-M3

Vision Language Models

MONAI Multimodal

Data | Models | Agents

Data

DICOM

TEXT

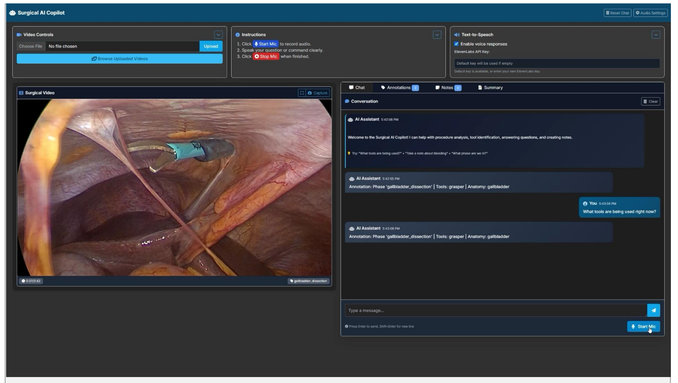
EHR

VIDEO

VOICE

Radiology Agent

Chain of Thought Reasoning



Surgical Agent

Information Retrieval & Notes

Agent Framework

Llama 3.2

Agents

Video Analysis

+

Task Models

Accelerate Medical AI with MONAI

Leading medical device companies, medical centers, biopharma, and research organizations

Siemens Healthineers

MONAI Deploy

Integrate AI into Siemens Syngo Carbon platforms

Philips

VISTA-3D and MAISI

Enhance MR imaging and improve image quality

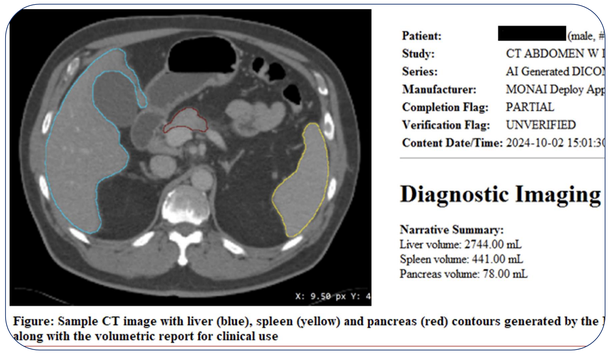
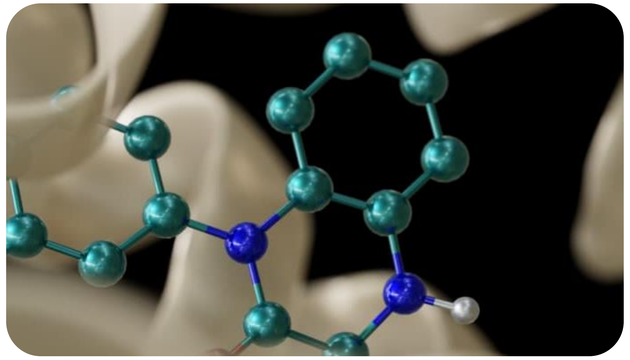


Figure: Sample CT image with liver (blue), spleen (yellow) and pancreas (red) contours generated by the
along with the volumetric report for clinical use

Cincinnati Children

MONAI | ISV: Weights & Biases

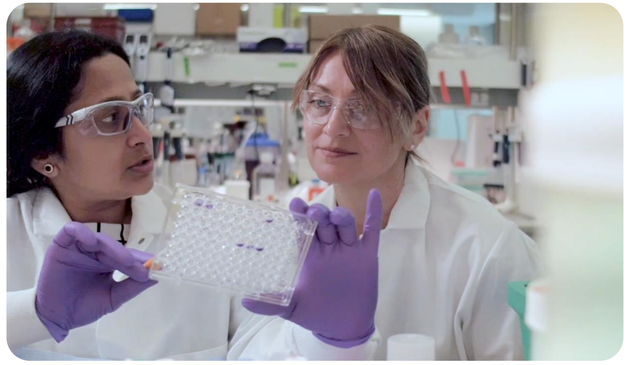
Train computer vision models for diagnostic object detection



GSK

MONAI Label

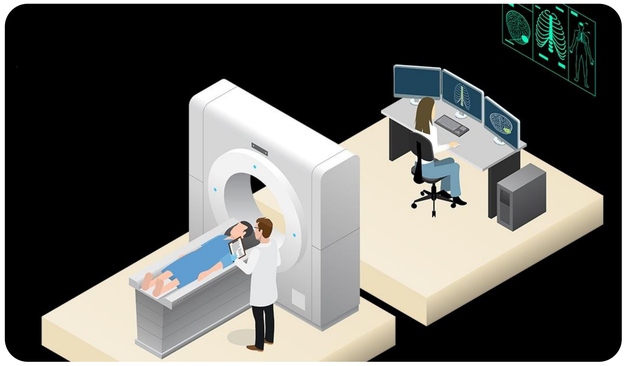
AI-assisted annotation with MONAI-Label and 3D Slicer



Bristol Myers Squibb

MONAI and DGX SuperPOD | ISV: Mark III Systems on Equinix

Segmentation of lesions, tumors, and organs in CT scans



University of Wisconsin-Madison

MONAI and DGX BasePOD | ISV: Flywheel on Azure

Accelerate the entire radiology workflow

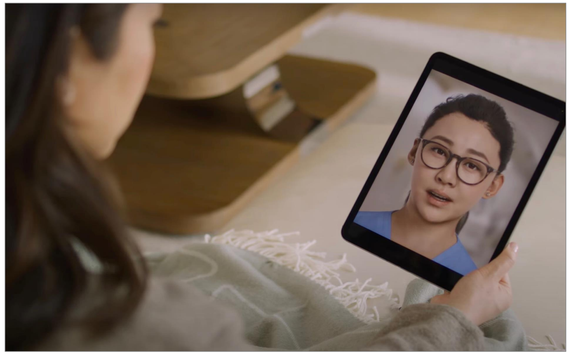
Digital Health

Digital Health Agents Everywhere

Always-on | Services-as-software

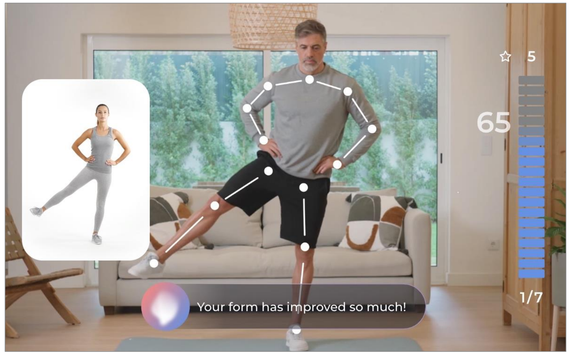
Ambient Medical Scribe

Abridge



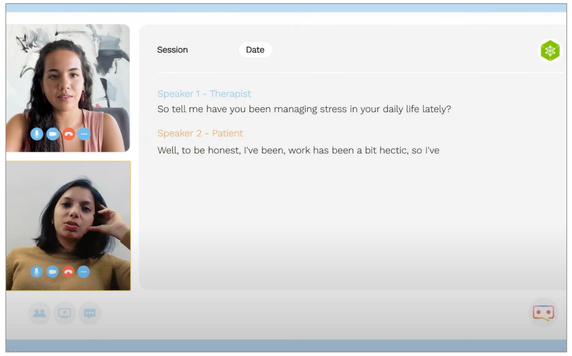
Post-Procedure Agent

Hippocratic AI



Physical Therapy Agent

Sword Health

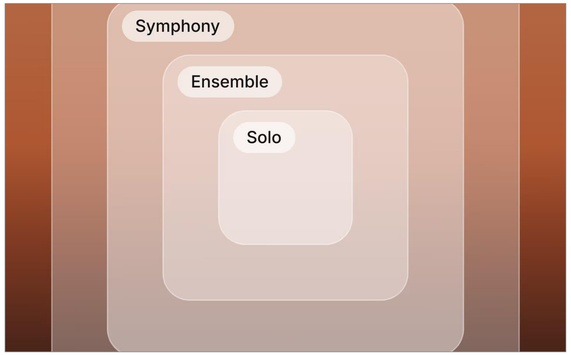


Mental Health Agent

Therapyside

Biological Insights Agent

Cytoreason

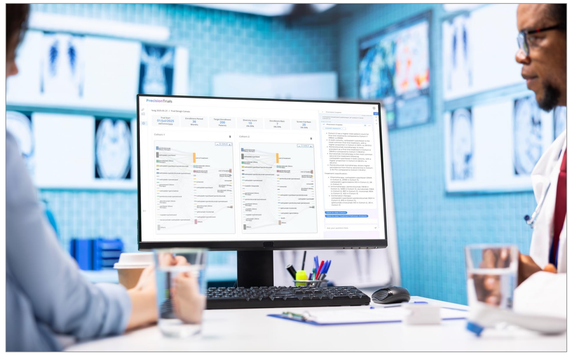


Conversational Agent

Corti

Clinic Assistant

Humanate



Clinical Trial Agent

ConcertAI

NVIDIA Provides the Building Blocks for Agentic AI

AI Blueprints


Research Assistant Agent


Customer Service Agent


Software Security Agent


Virtual Lab Agent


Video Analytics Agent

NVIDIA NeMo

Curator | Customizer | Evaluator | Guardrails | Retriever

NVIDIA NIM

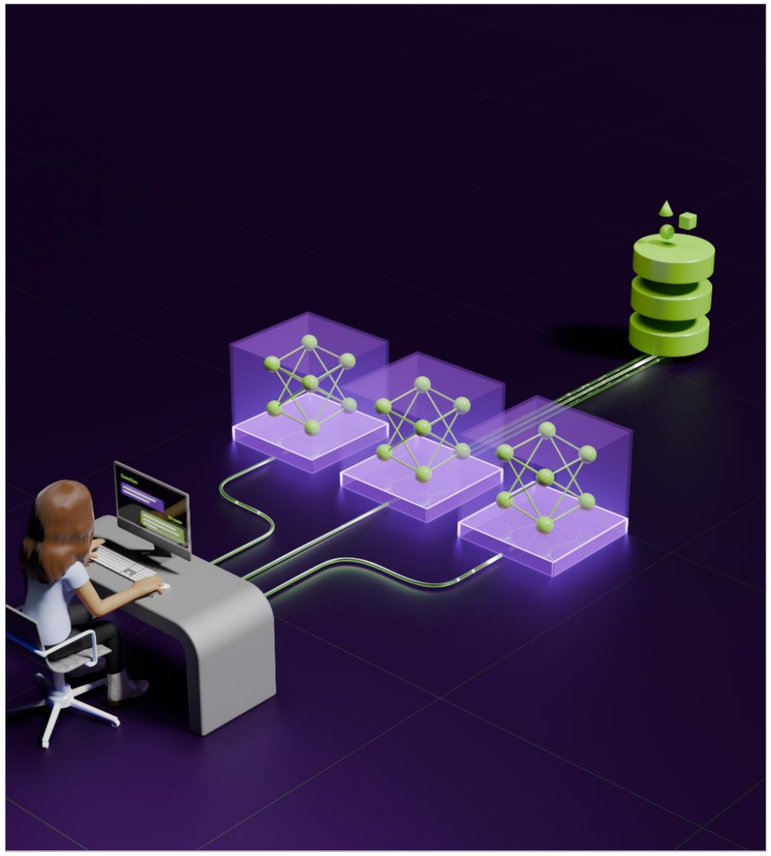
Understanding & Reasoning | Information Retrieval | AI Safety | Digital Humans | Visual Content Generation | Digital Biology | Physical AI

AI Infrastructure

GPU | CPU | DPU | Networking

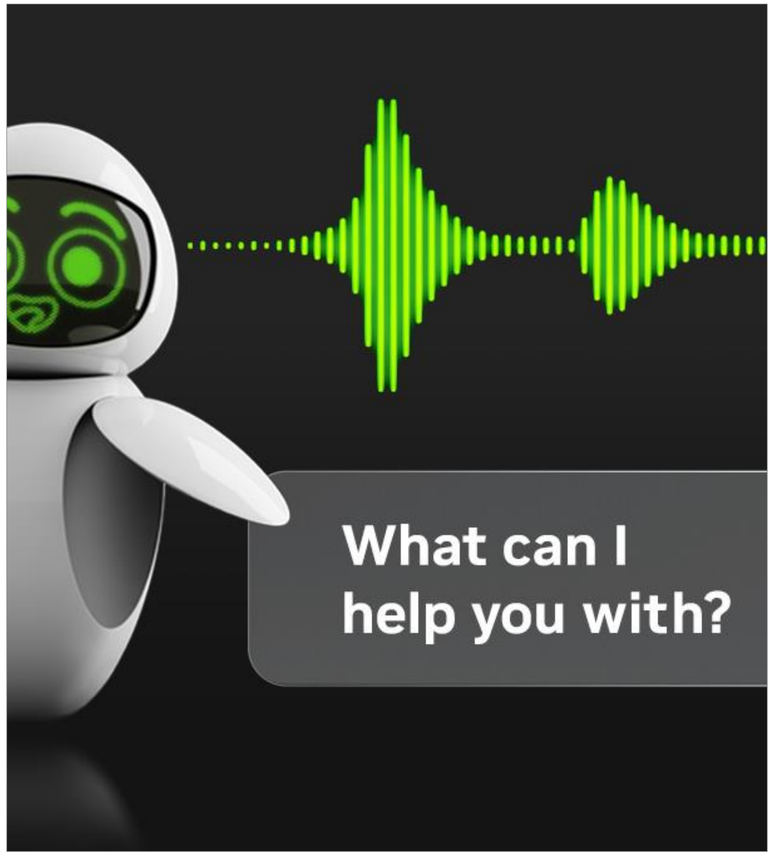
NVIDIA Agentic AI Enterprise Solutions

Improving patient provider experiences



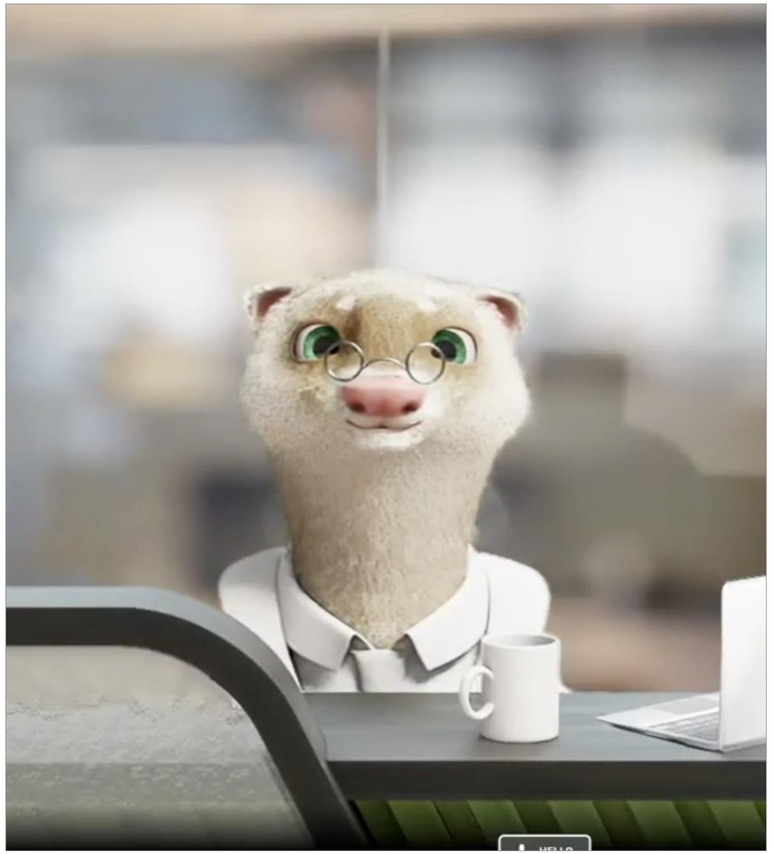
Reasoning Agents

Understand Data
Extract Insights
Deal with Complexity



Conversational AI

Automatic Speech Recognition
Bilingual and Multilingual Translation Support
Male, Female Voice Synthesis

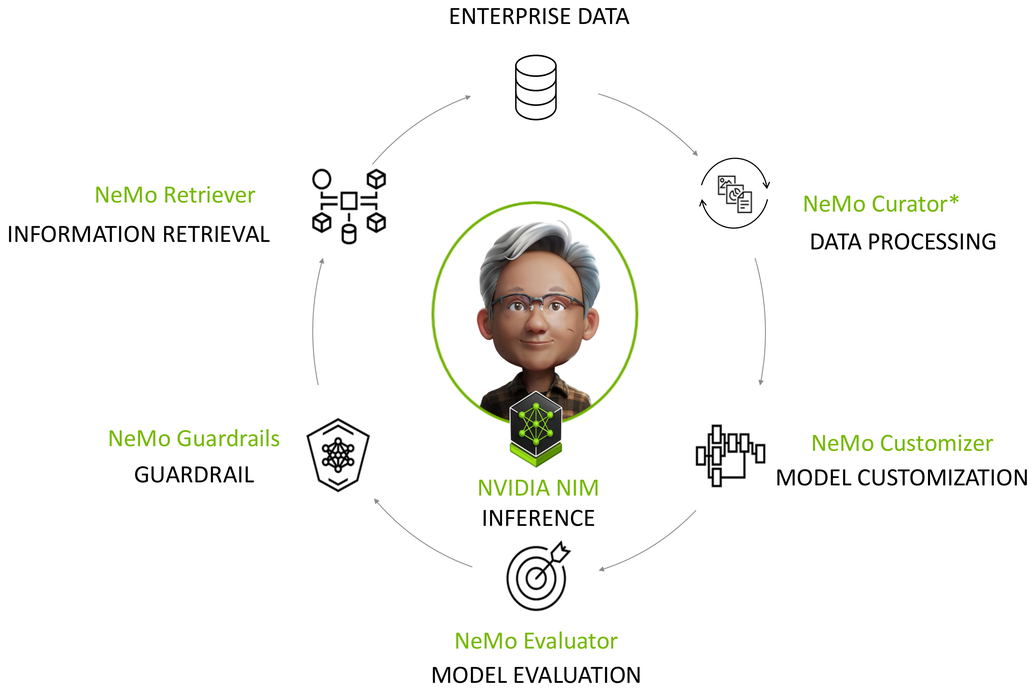


Ambient Patient Engagement

Interactive Conversational AI
Current and Contextual with Retrieval Augmented Generation

NVIDIA NeMo Microservices

End-to-end platform with modular microservices to scale AI agent optimizations



Easy to Operate | Boost Accuracy | Increase Efficiency | Enterprise-Grade | Run Anywhere