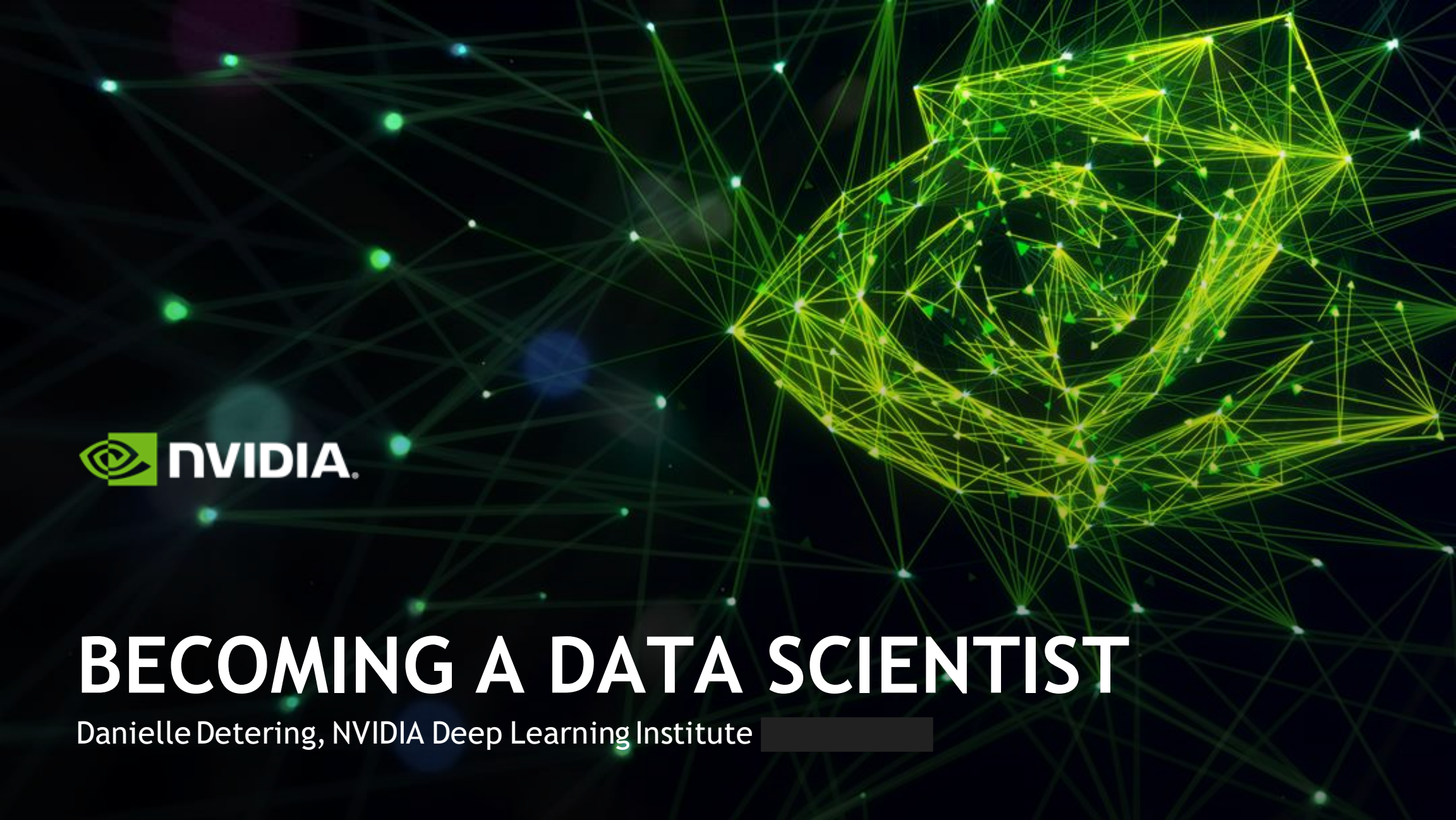
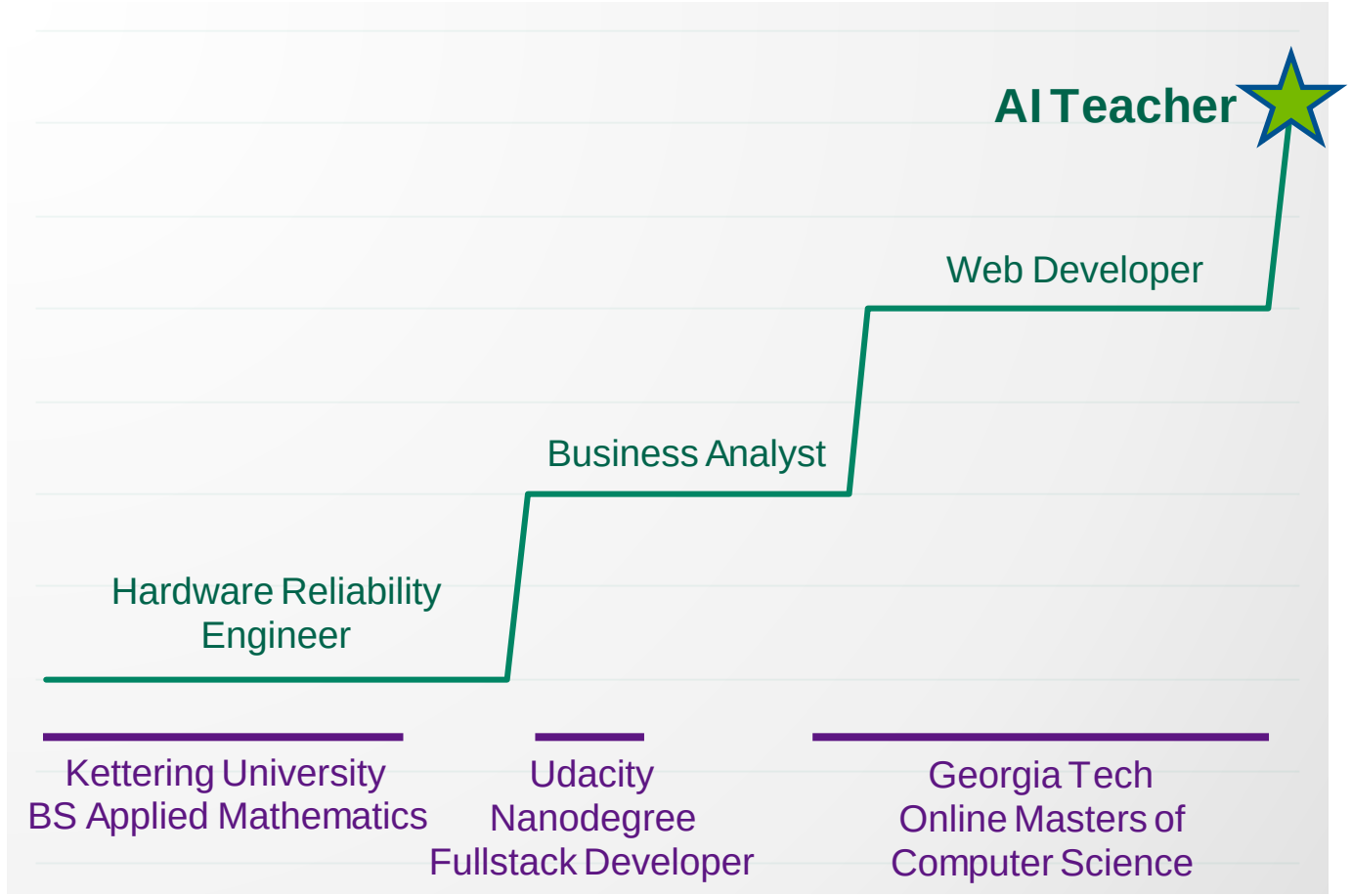


BECOMING A DATA SCIENTIST

Danielle Detering, NVIDIA Deep Learning Institute

Danielle Detering
DLI Content Developer

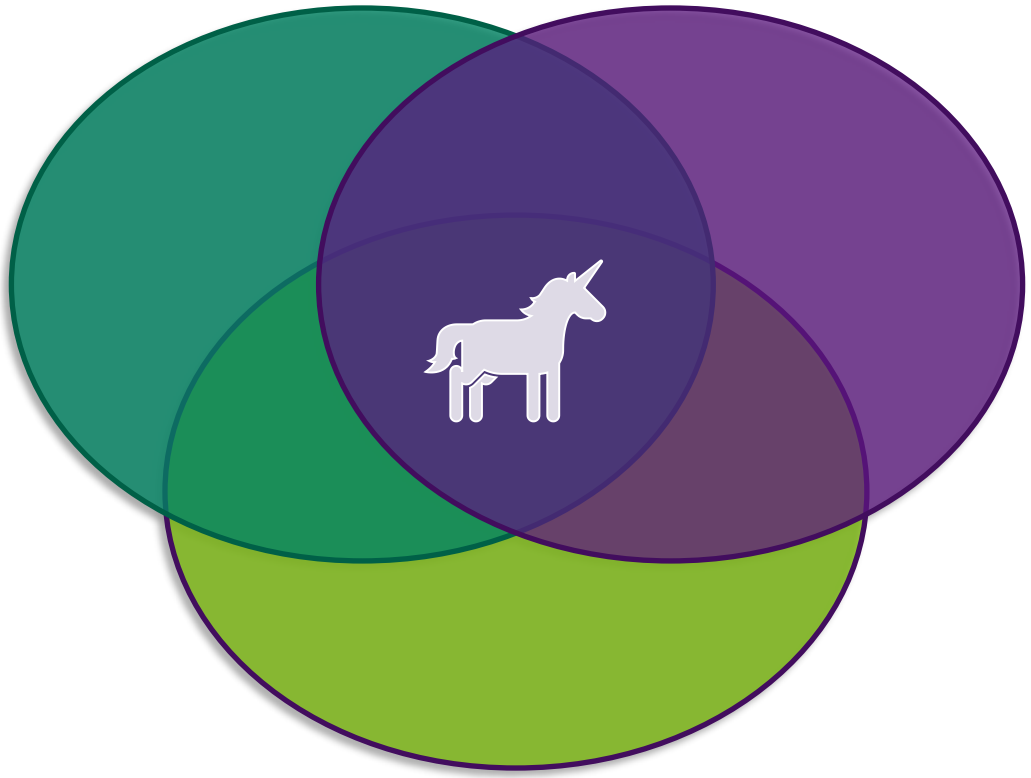
MY DATA SCIENCE JOURNEY



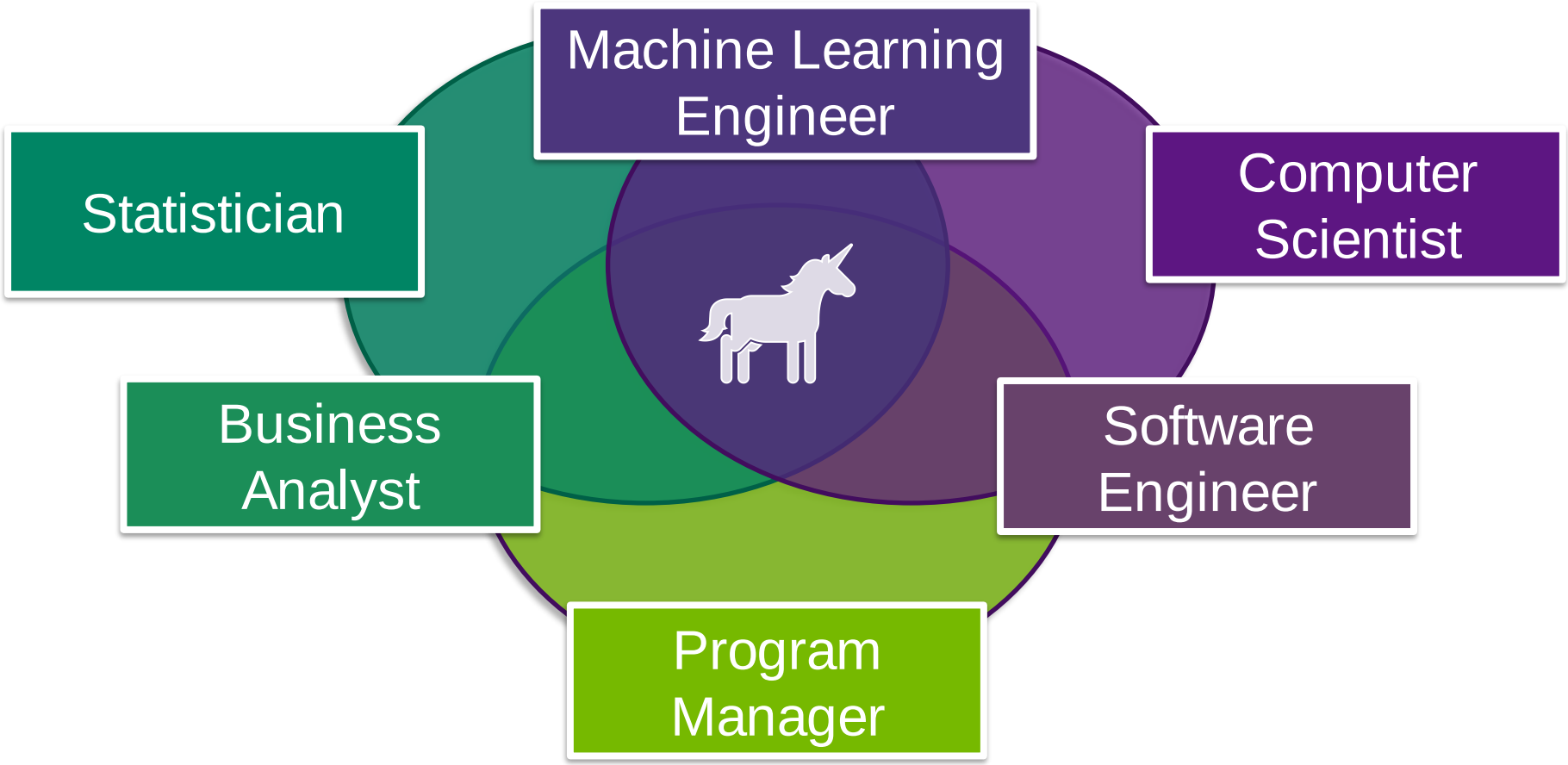
Training developers, data scientists, researchers and IT professionals how to solve their most challenging problems

KEYS TO SUCCESS

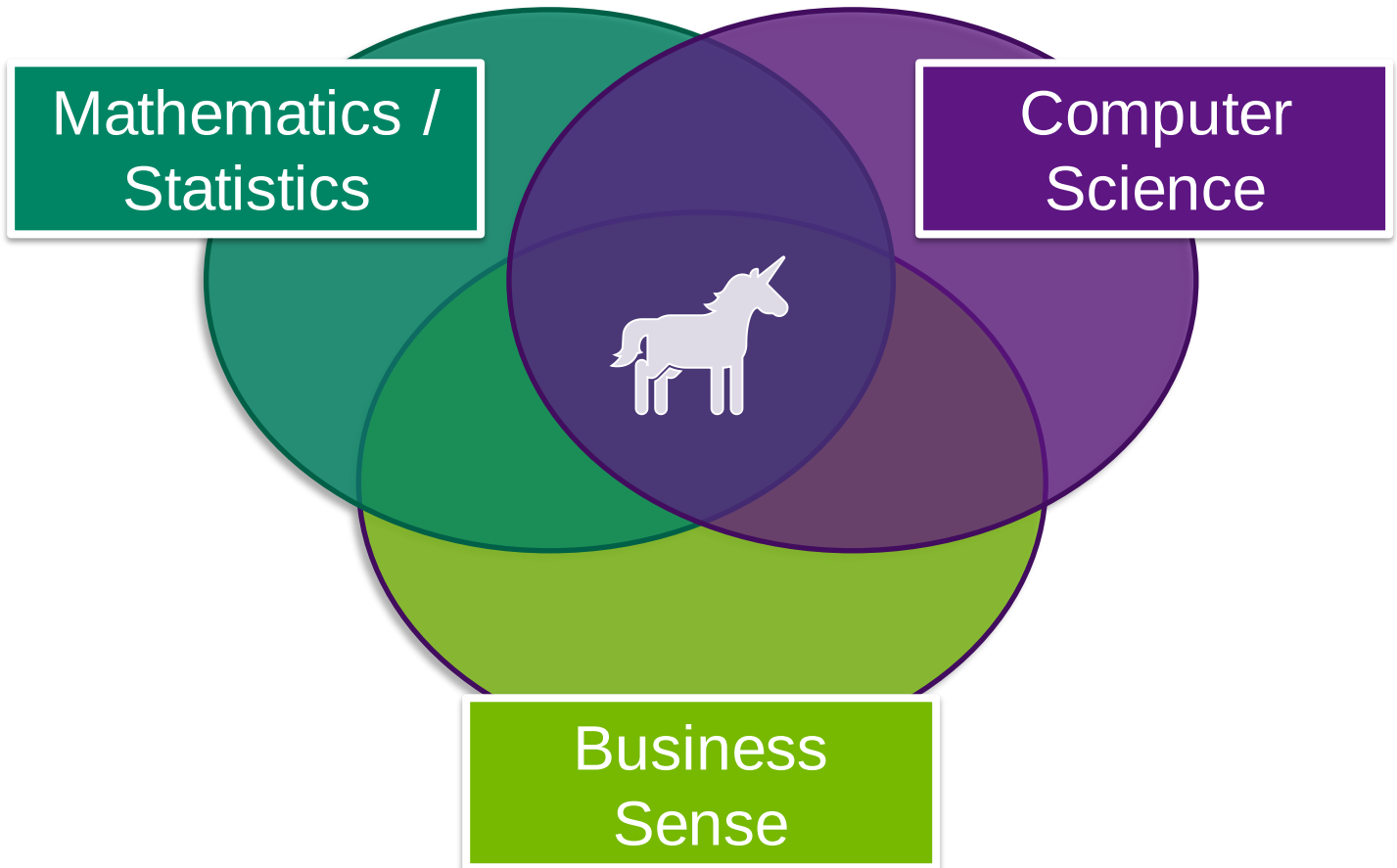
DATA SCIENCE "UNICORNS"



DATA SCIENCE "UNICORNS"



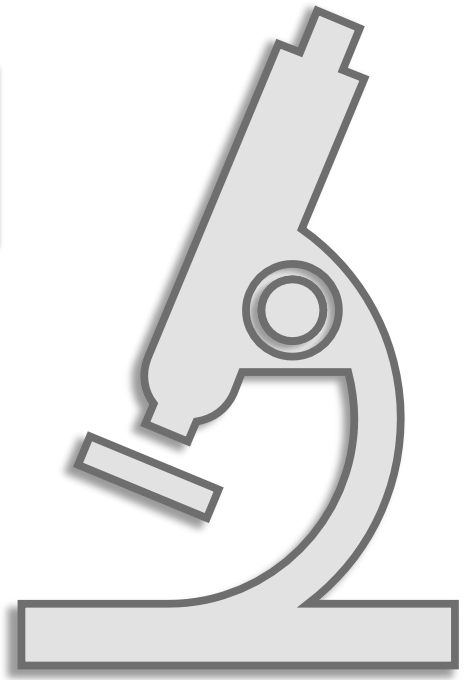
DATA SCIENCE "UNICORNS"



UNIVERSITY VS WORKSHOPS

University
"Coarse" Adjustment

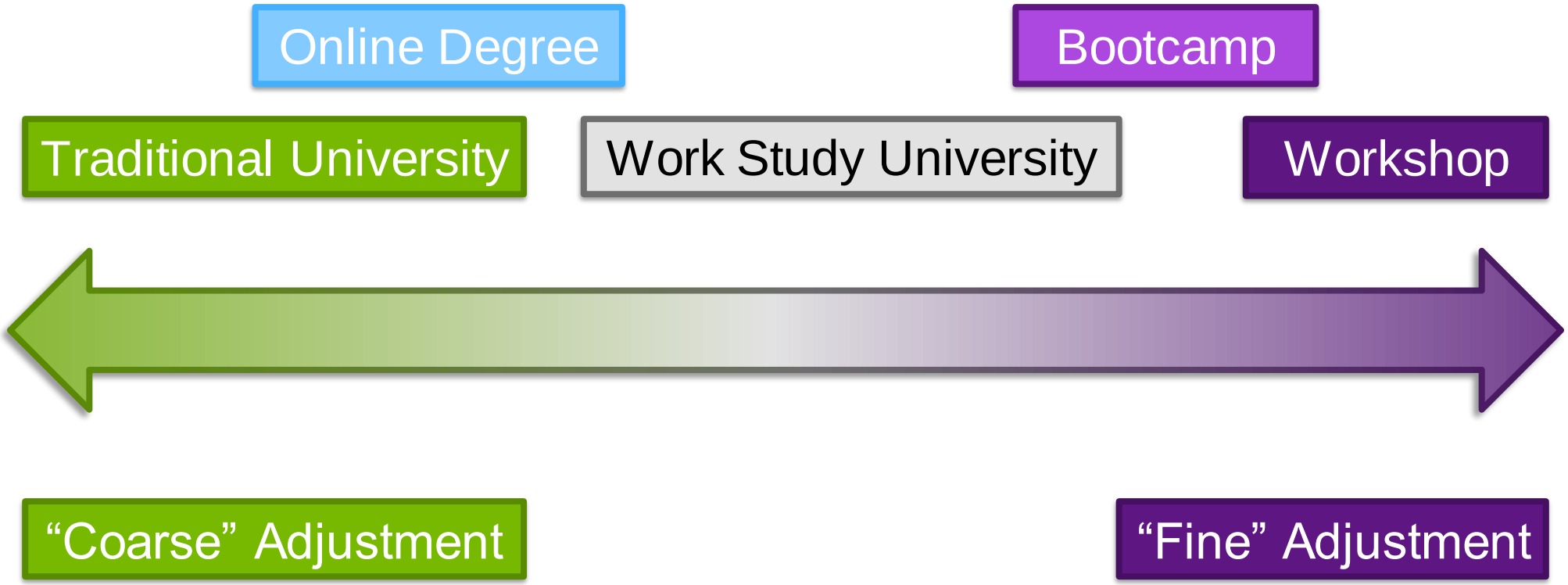
- Takes many weeks
- Covers concepts in great depth



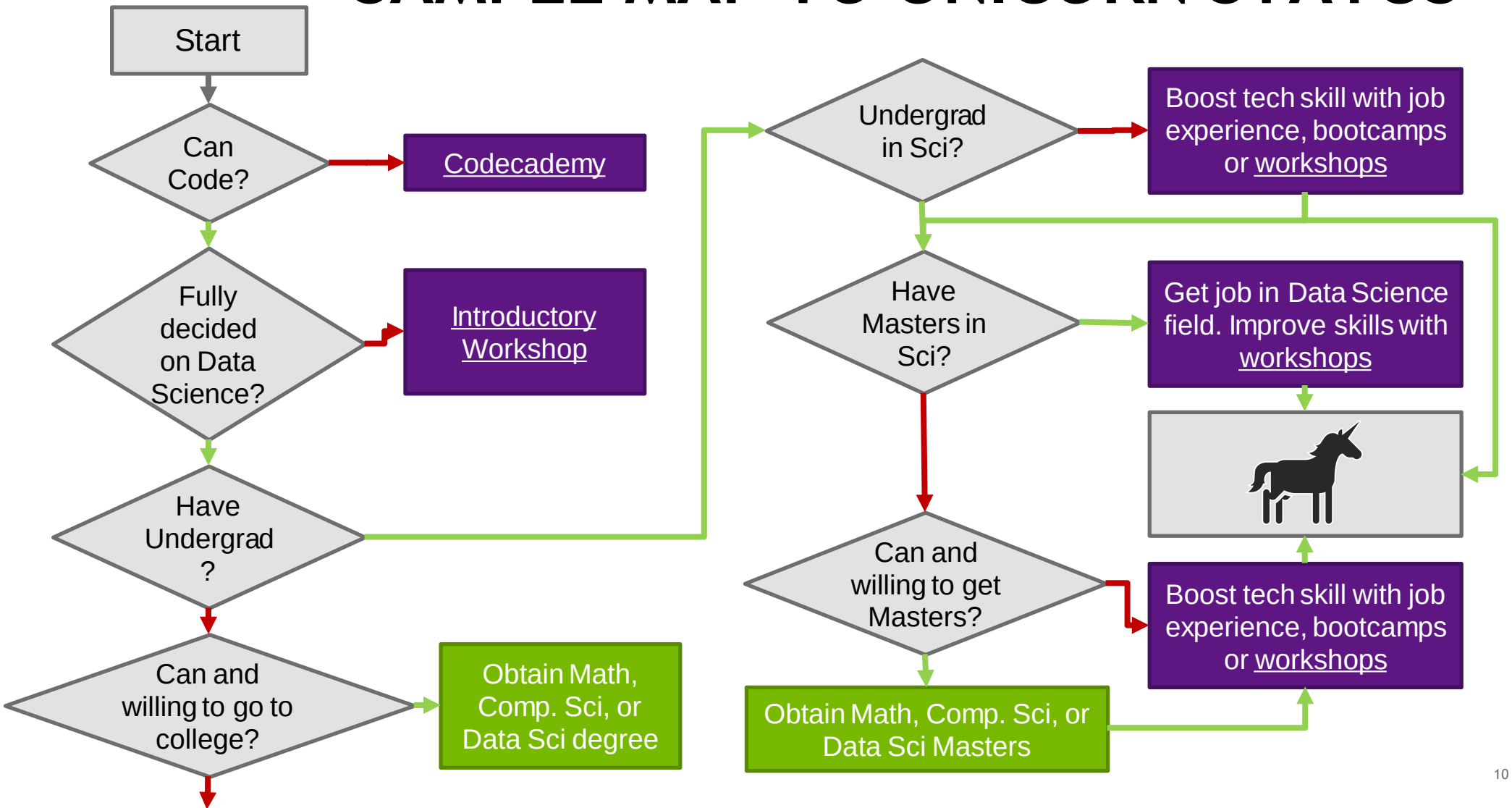
Workshop
"Fine" Adjustment

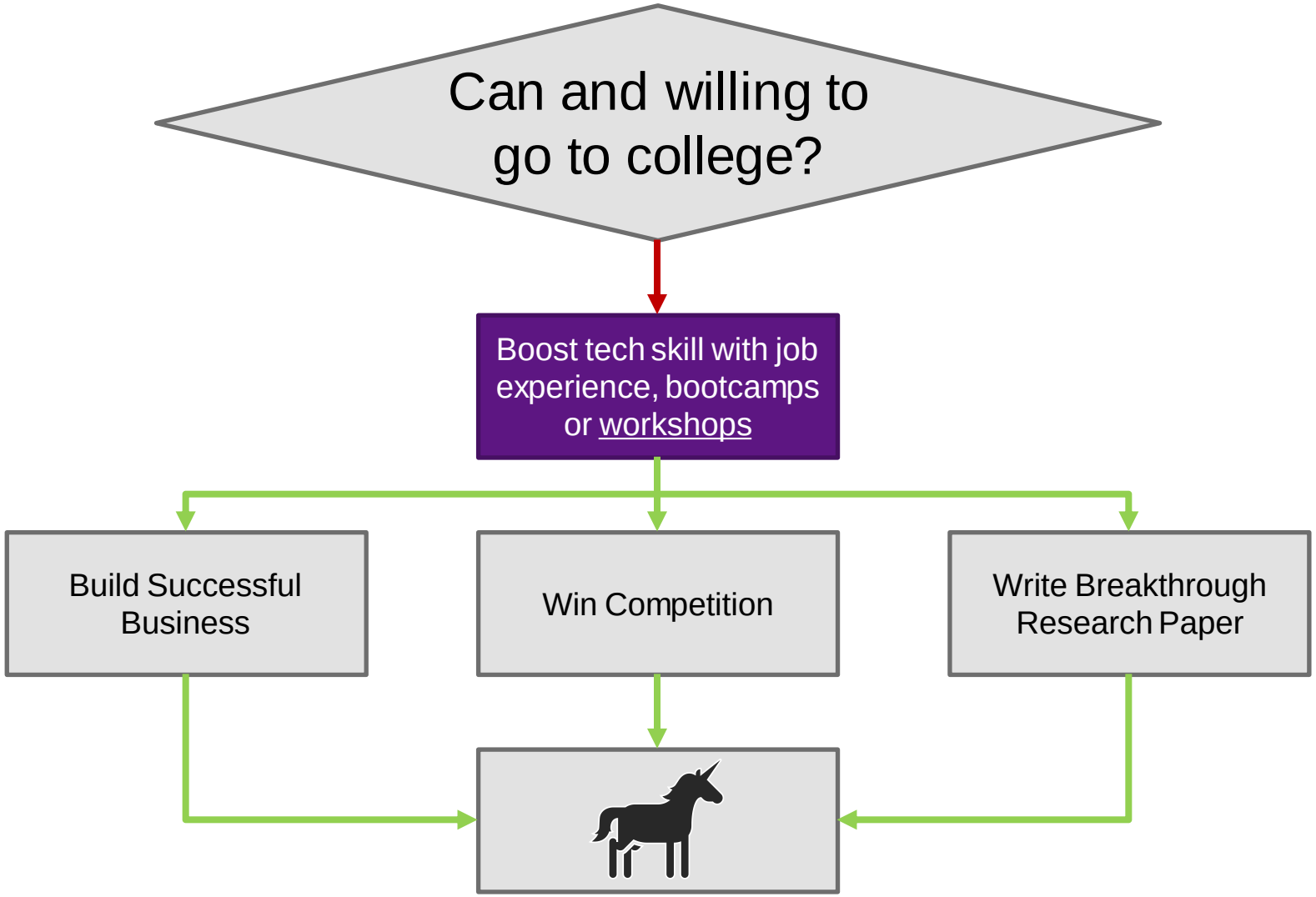
- Takes a few hours or days
- Covers cutting edge topics close to industry

UNIVERSITY VS WORKSHOPS



SAMPLE MAP TO UNICORN STATUS




Can and willing to go to college?
Boost tech skill with job experience, bootcamps or workshops
Build Successful Business
Win Competition
Write Breakthrough Research Paper

TIPS FOR NAVIGATING

Find an “Accountability Partner”

Find a goal that inspires you

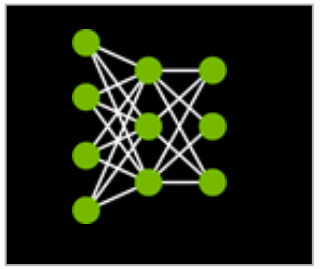
- Teach AI to play games?
- Teach an AI to sing?
- Teach a robot dog to fetch the paper?

NVIDIA DEEP
LEARNING INSTITUTE

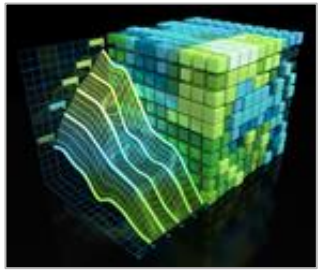
RICH CONTENT PORTFOLIO

Fundamentals and advanced hands-on training in key technologies and application domains

Caffe2 · Microsoft Cognitive Toolkit · mxnet · TensorFlow · PYTORCH · Keras · theano



Deep Learning Fundamentals



Accelerated Computing Fundamentals

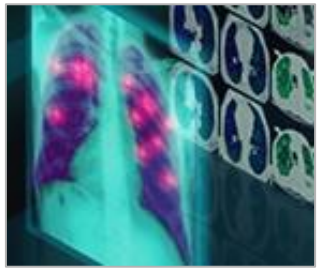
Accelerated Data Science Fundamentals

Intro to AI in the Data Center

AI for Anomaly Detection

AI for Autonomous Vehicles

AI for Digital Content Creation



AI for Healthcare

AI for Industrial Inspection

AI for Intelligent Video Analytics

AI for Predictive Maintenance

AI for Robotics

WHAT DOES DLI OFFER?

SELF-PACED ONLINE

- Get started anywhere, any time with access to a GPU-accelerated workstation in the cloud
- Full-day courses (8 hrs) are $90
- 2-4 hour courses are $30

Bulk pricing is also available

Get started www.nvidia.com/dli

INSTRUCTOR-LED WORKSHOP

- Full-day workshops onsite at your location or remote, delivered by DLI certified instructors
- MSRP: $10K/day for up to 20 attendees (EDU pricing available)
- Request through your account manager

Public workshop schedule here.

ENTERPRISE SOLUTIONS

- End-to-end training solution with executive briefings, enterprise-level reporting, and a mix of onsite and online training
- Pricing varies
- Request through your account manager

INSTRUCTOR-LED WORKSHOPS

In-person or Remote

AGENDA

Introduction (45 mins)

Break (15 mins)

Training task #1 (1:20 mins)

Lunch (60 mins)

Training task #2 (1:20 mins)

Break (15 mins)

Training task #3 (1:20 mins)

Summary/Q&A (15 mins)

BENEFITS OF WORKSHOP

Get guidance from DLI Certified Instructors while working through material

Hear from experts during the introductory lecture

Collaborate with and learn from peers

Access fully-configured, GPU-accelerated workstations in the cloud

Earn a certificate of competency in course subject matter

ONLINE TRAINING

BENEFITS OF SELF-PACED TRAINING

Take training any time, anywhere. All you need is a laptop and Internet connection.

Access fully configured, GPU-accelerated workstations in the cloud for hands-on training.

Learn at your own pace with hands-on exercises and videos.

Earn a certificate of competency in 8-hr course subject matter (digital badge of completion for IT training.)

Customers can purchase bulk codes for online courses

DLI UNIVERSITY TRAINING

Learn more at
www.nvidia.com/dli

UNIVERSITY AMBASSADOR PROGRAM

- Qualified faculty and researchers can get certified to teach DLI workshops to their students at no cost.
- Hundreds of universities certified around the world, including:

Arizona State University
Columbia University in the City of New York
香港科技大學 The Hong Kong University of Science and Technology
Massachusetts Institute of Technology
NUS National University of Singapore
University of Oxford

TEACHING KITS

- Qualified university educators can download courseware across deep learning, accelerated computing, and robotics.
- Kits include lecture materials, GPU cloud resources, access to self-paced DLI courses, and more.

OFFERINGS OVERVIEW

Traditional College

Arizona State University

The Hong Kong University of Science and Technology

Columbia University in the City of New York

NUS National University of Singapore

Massachusetts Institute of Technology

University of Oxford

Nanodegree

UDACITY

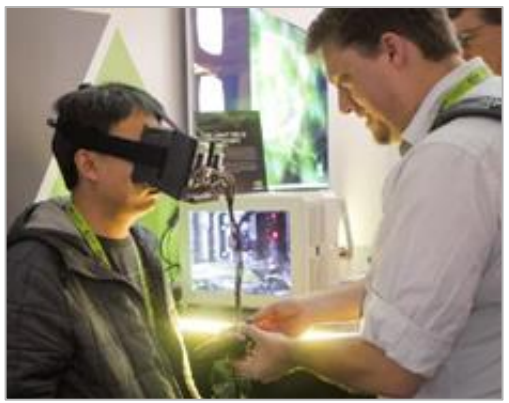
- Udacity Self-Driving Car Nanodegree
- Udacity Robotics Nanodegree
- Udacity Computer Vision Nanodegree

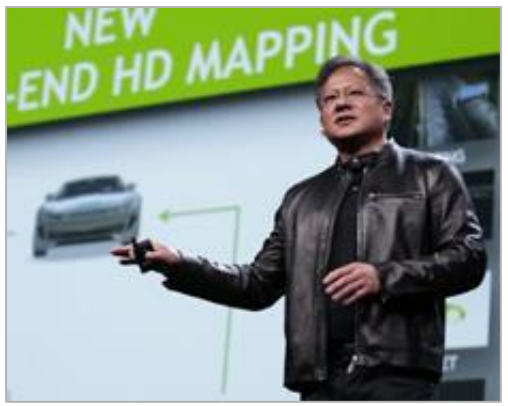
Workshops

- Fundamental of Deep Learning for Computer Vision
- High Performance Computing with Containers
- And more!

"Coarse" Adjustment

"Fine" Adjustment





ADVANCE YOUR DEEP LEARNING KNOWLEDGE AT GTC

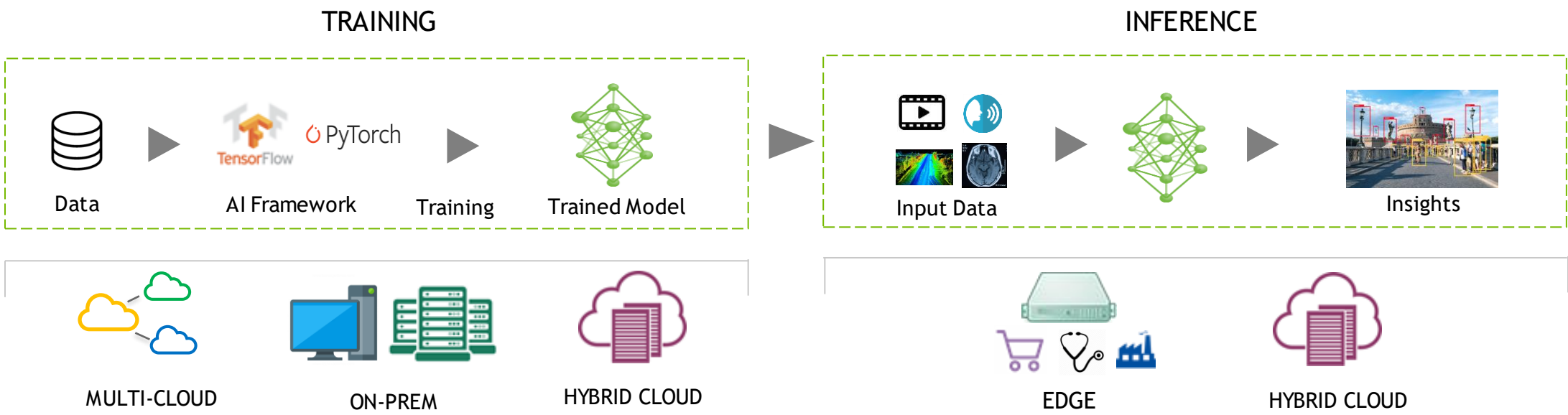
The world's most important event for GPU developers

WWW.GPUTECHCONF.COM

ACCELERATING AI
WORKFLOWS WITH NGC

A TYPICAL AI WORKFLOW

Training and Inference



DIFFERENT ROLES. SAME GOALS.

Driving Productivity and Faster Time-to-Solutions

Data Engineer

Gather, organize, manage data to build models

Data Scientists and Researchers

Model convergence & accuracy

Developers

Integrate models in application software

DevOps

Deploy and maintain ML systems in production reliably and efficiently

Sys Admins

Support internal and external customers

NVIDIA NGC | ACCELERATING TIME TO SOLUTION

SIMPLIFY DEVELOPMENT

MANAGE & SECURE APPLICATIONS

DEPLOY ANYWHERE

NGC Catalog

Containers | Models | Helm Charts

Build | Customize | Integrate

NGC Private Registry

Access Control | Scanning, Signing, Encryption | Lifecycle Management

Manage | Secure | Share

NGC-Ready

On Premises | Cloud | Edge

ENABLING PORTABILITY WITH NGC CONTAINERS

Extensive

- Diverse range of workloads and industry specific use cases

Optimized

- DL containers updated monthly
- Packed with latest features and superior performance

Secure & Reliable

- Scanned for vulnerabilities and crypto
- Tested on workstations, servers, & cloud instances

Scalable

- Supports multi-GPU & multi-node systems

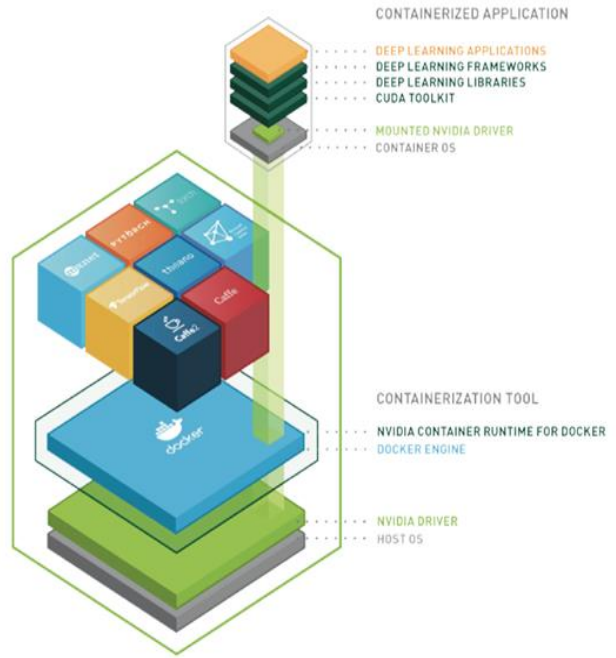
Designed for Enterprise & HPC

- Supports Docker, Singularity & other runtimes

Run Anywhere

- Bare metal, VMs, Kubernetes
- x86, ARM, POWER
- Multi-cloud, on-prem, hybrid, edge

NGC Deep Learning Containers



CONVERSATIONAL AI — JARVIS | HEALTHCARE — CLARA | SMART CITIES — DEEPSTREAM & SMART PARKING | TELECOM — AERIAL | AUTONOMOUS DRIVING — DRIVE | ROBOTICS — ISAAC | HPC — HPC SDK

Learn more about NGC Containers

CONTINUOUS PERFORMANCE IMPROVEMENT

Developers' Software Optimizations Deliver Better Performance on the Same Hardware

Monthly DL Framework Updates & Stack Optimizations Drive Performance

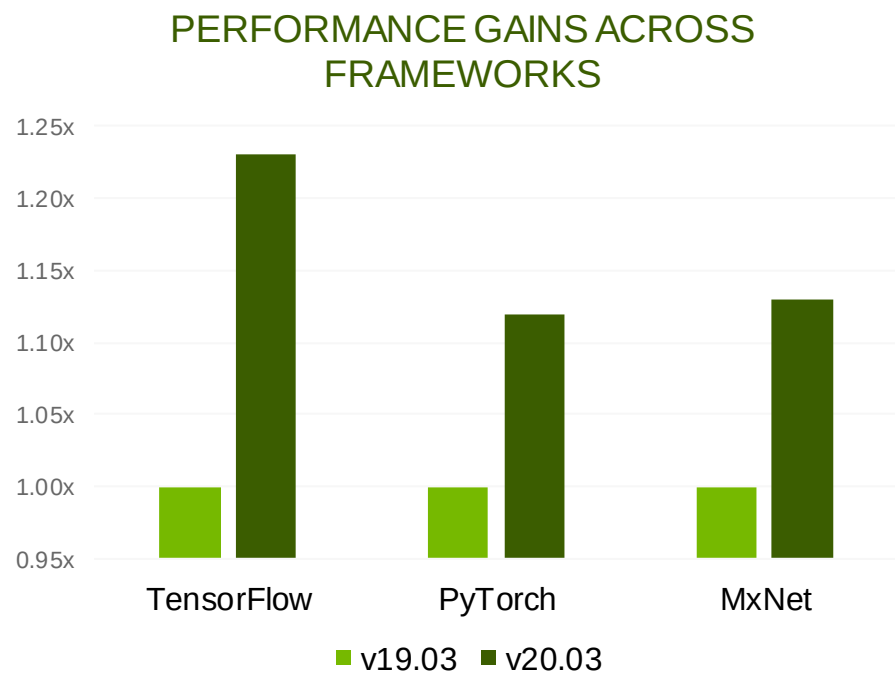
cuDNN - Highly tuned standard training routines

cuBLAS - Highly tuned matrix multiplication

DALI – Moves compute intensive pre-processing to GPUs

NCCL – Faster training across multi-GPU architecture

Framework – Latest versions w/ newest features and superior perf



512 Batch Size for TF & PyT, 256 Batch size for MxNet | ResNet-50 Training v1.5| 16x V100 | DGX-2

NVIDIA

PRE-TRAINED MODELS AND MODEL SCRIPTS

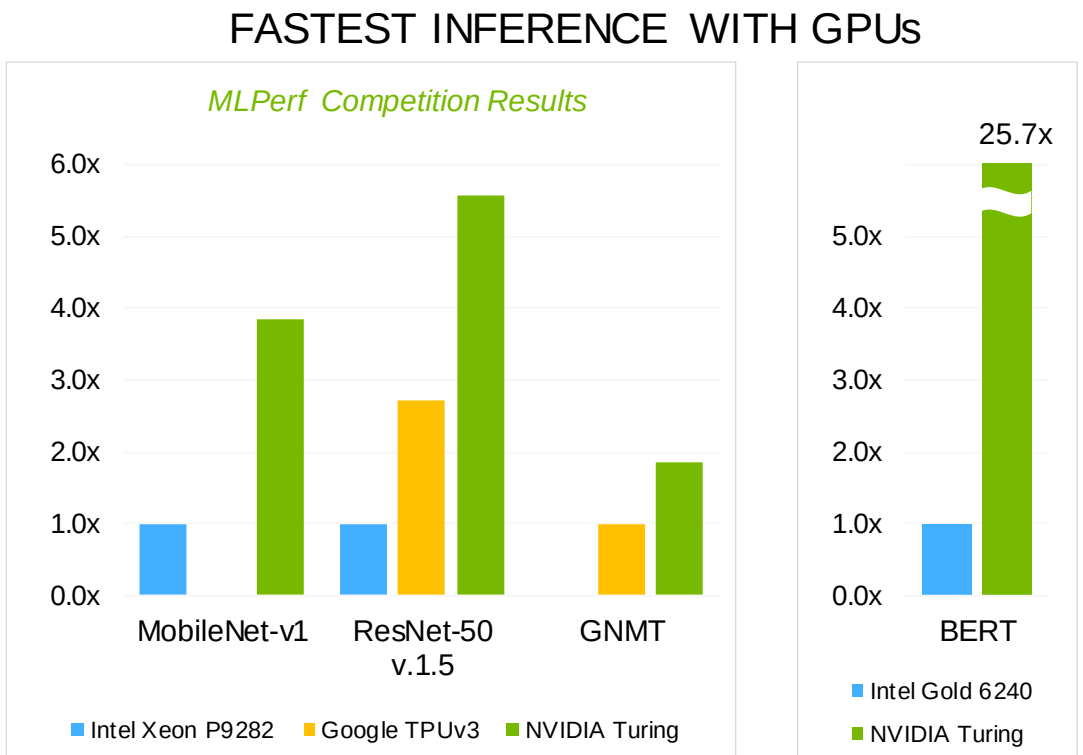
Build AI Faster

PRE-TRAINED MODELS

- Popular AI tasks – ASR, NLU, TTS, RecSys, CV, etc
- Industry specific models – Medical imaging, public safety
- Customize with your data and transfer learning
- Integrate into existing workflows with SDKs

MODEL SCRIPTS

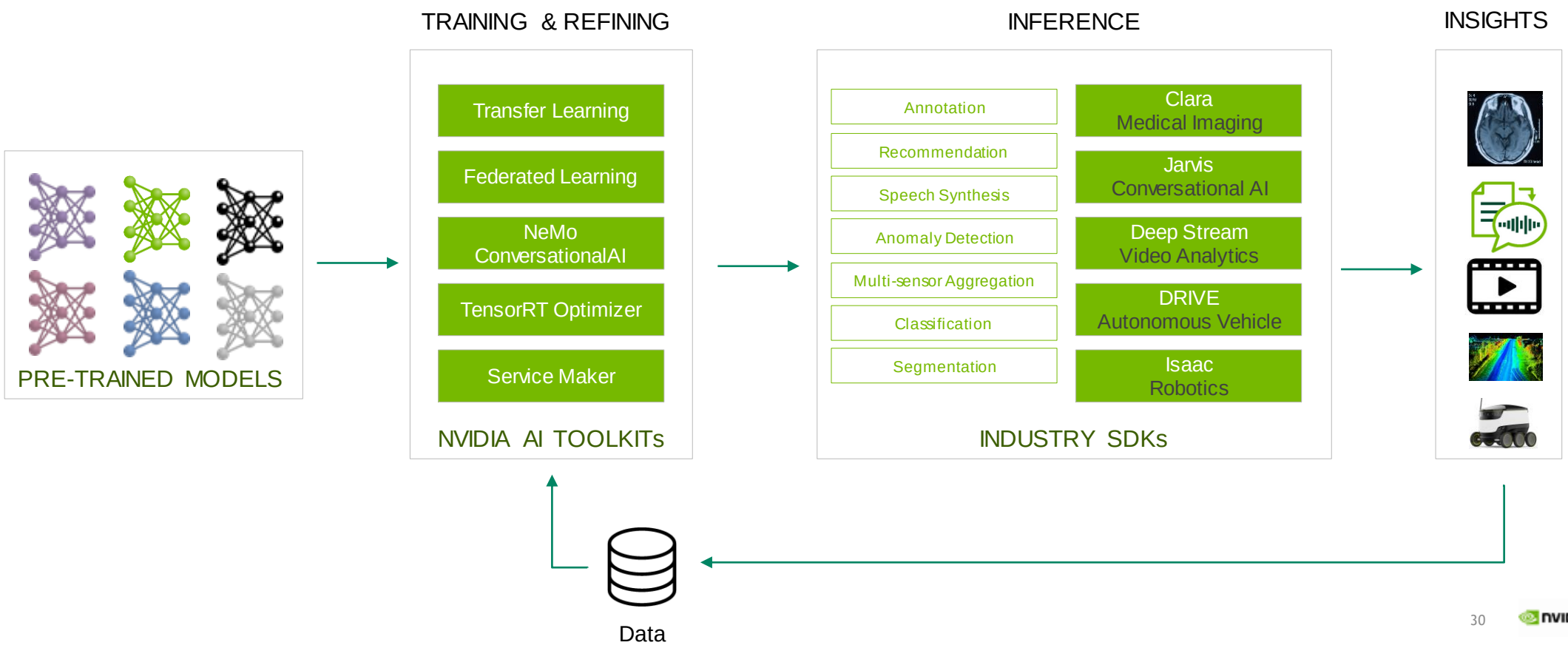
- Reference neural network architectures across all domains and popular frameworks with latest SOTA
- Code samples show you how to deploy or build your models



MLPerf v0.5 Inference Closed; Retrieved from www.mlperf.org 6 November 2019. Per-accelerator performance derived from the best MLPerf results for respective submissions using reported accelerator count. MLPerf name and logo are trademarks. See www.mlperf.org for more information.
BERT performance measured by NVIDIA with OpenVINO (2020.2) on Gold 6240 vs. NVIDIA T4

AI TOOLKITs AND SDKs

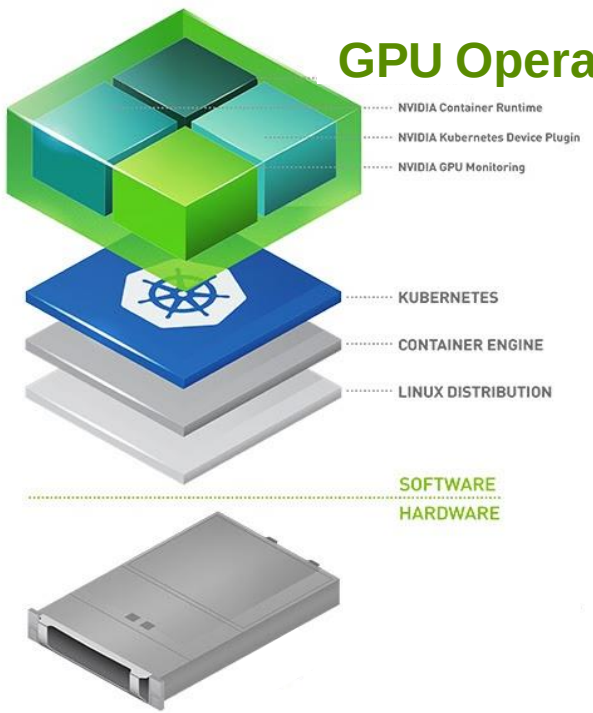
Build AI Even Faster



CLOUD NATIVE DEPLOYMENT APPROACH

Enabling Consistent Deployment Across Platforms with Kubernetes

NVIDIA EGX Stack



kubernetes

Container Orchestration
Automated container deployment including self-healing

HELM

Helm is NVIDIA's recommended package manager for Kubernetes that allows you to more easily configure, deploy and update applications on Kubernetes

NGC PRIVATE REGISTRY

Secure, Cloud-hosted Platform to Collaborate and Build Faster

Access Control

- User roles allow you to discover, share and control your assets

Secure

- Encryption at rest and in transit

- Automated Security Scanning to protect your container images against a comprehensive list of CVEs, crypto keys

- Container signing to ensure the software comes from a trusted source and hasn't been tampered with

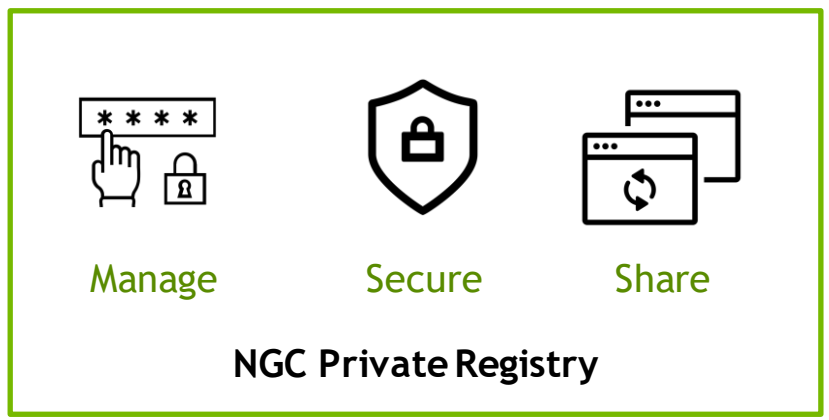
Lifecycle Management

- Build and share your artifacts with cross-functional teams

- Version control system designed for models

- Use NGC's flexible API, CLI and Web UI to build workflows

Private Registry Documentation



WHY NGC

Optimized for Enterprise Needs

CURATED SOFTWARE

FASTER TIME TO SOLUTION

- Built & maintained by experts
- Covers popular applications & use cases
- Supercharged with latest features

SUPERIOR PERFORMANCE

RUN LARGER MODELS/SIMULATION

- AI s/w constantly optimized
- Instantly access latest features and highest performance
- Winner of MLPerf competition

TESTED ACROSS PLATFORMS

RELIABLE SOFTWARE

- Supports multi-GPU & multi-node systems
- Passes stringent security scans
- Cloud | Edge | On-prem | Workstations

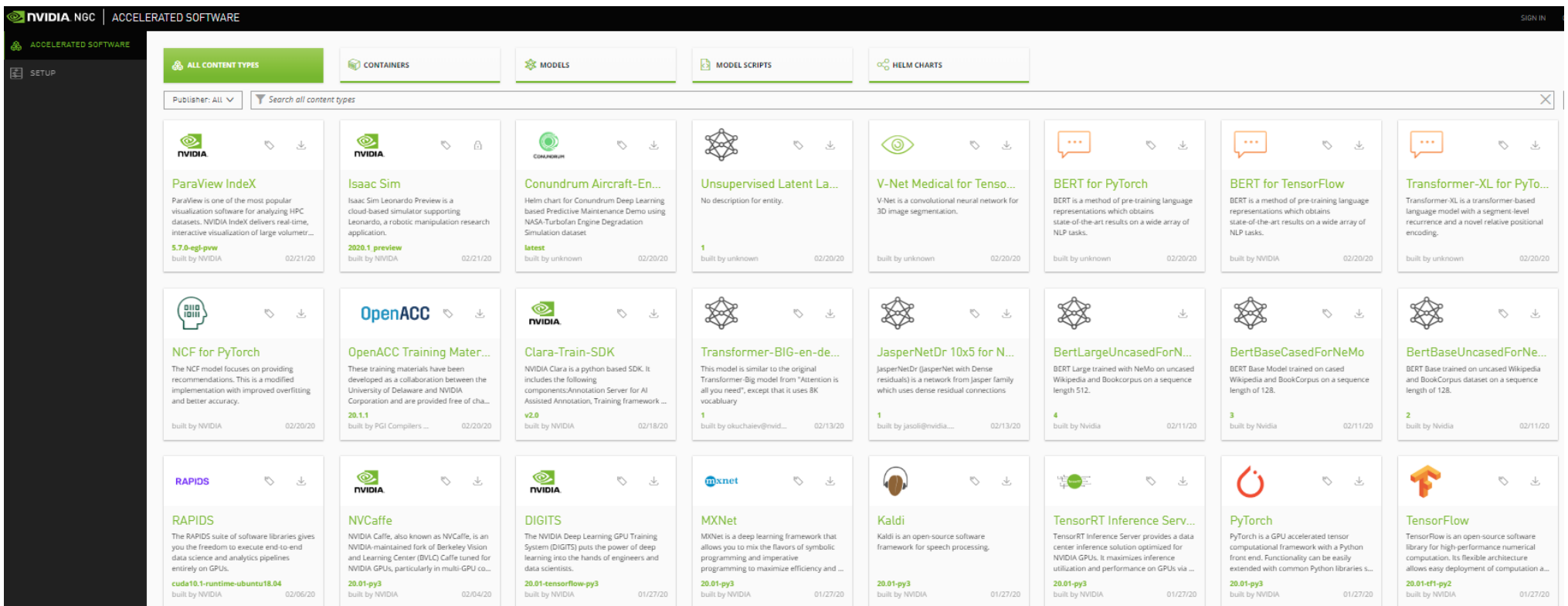
ENTERPRISE-GRADE SUPPORT

DEPLOY WITH CONFIDENCE

- Access to NVIDIA AI experts
- Faster time-to-solution
- Minimizes system downtimes

BUILD AI FASTER. DEPLOY ANYWHERE WITH NGC

ngc.nvidia.com



WHAT'S NEXT

GET THE BASICS

Watch "Deep Learning and Beyond"

Listen to the NVIDIA AI Podcast

Review examples of AI in action

LEARN WITH DLI

Take a self-paced online training at www.nvidia.com/dli

Request an onsite or remote workshop through your account manager

JOIN OUR COMMUNITY

Sign up for the NVIDIA Developer Program at https://developer.nvidia.com/join

NGC Catalog

Check out the available containers and resources in the NGC Catalog

See the docs to get started

Contact us at nvdli@nvidia.com

NVIDIA
www.nvidia.com/dli
www.nvidia.com/gpu-cloud/