A dark, abstract background featuring a dense network of glowing green lines. These lines form a complex, twisted shape that resembles a stylized DNA helix or a microscopic view of a neural network. The lines are bright green and appear to be composed of many thin, individual fibers. They curve and twist across the frame, creating a sense of depth and motion.

Day 1

INSTRUCTOR



Leo Chen

SPONSORS



TA (DevTech Team @ NVIDIA)

We're Hiring



Reese



Ming



Frank



Anthony

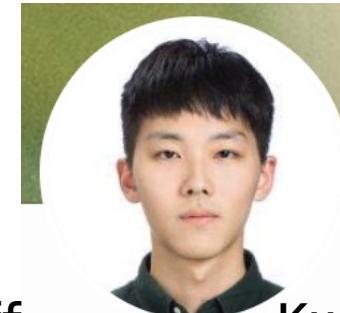
TA (Solution Architect @ NVIDIA)



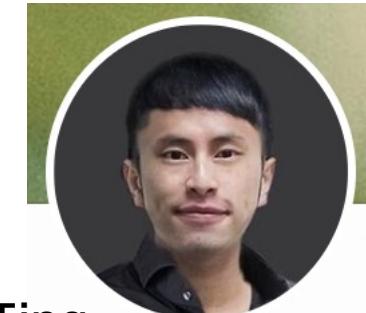
CK



Cliff



Kuan-Ting

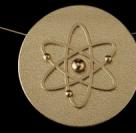


Jay



AI APPLICATION
FRAMEWORK

PLATFORMS



NVIDIA
SCIENTIFIC
COMPUTING
(HPC)



NVIDIA
AI



NVIDIA
Omniverse

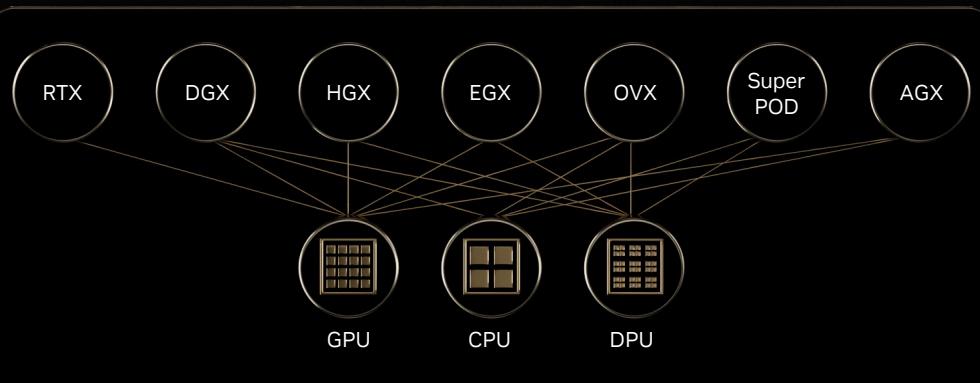
ACCELERATION
LIBRARIES



**3.5 M
Developers**

CLOUD-TO-EDGE
DATACENTER-TO-ROBOTIC SYSTEMS

3 CHIPS





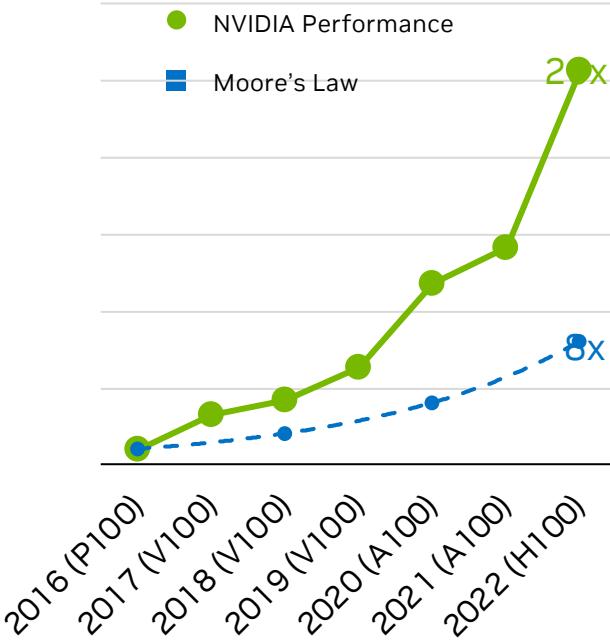
Agenda – Day 1 (Online)

- 09:00 ~ 09:15 : ☺☺☺ Welcome & Group Photo ☺☺☺
- 09:15 ~ 09:30 : Connecting to a Cluster
- 09:30 ~ 10:00 : [Lecture] Introduction to GPU Computing
- 10:00 ~ 10:50 : [Lab] Accelerating Standard C++ and Fortran
- 10:50 ~ 11:00 : Break
- 11:00 ~ 12:30 : [Lab] Directive Based Programming with OpenACC

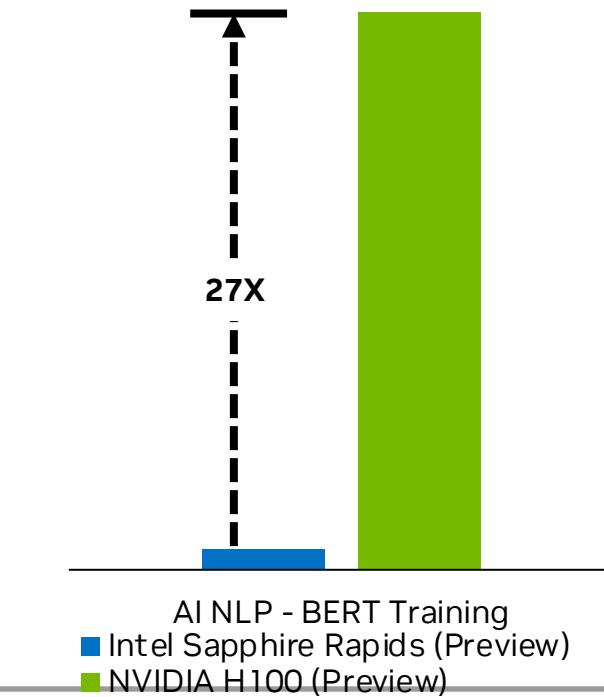
Massive Leaps in Delivered Application Performance

Accelerated Computing Significantly Outperforms Moore's Law Based CPU-Architectures

26X AI+HPC Performance in 6 Years Relentless Full Stack Innovation



MLPerf AI Leadership Massive Speedups on State-of-the Art AI

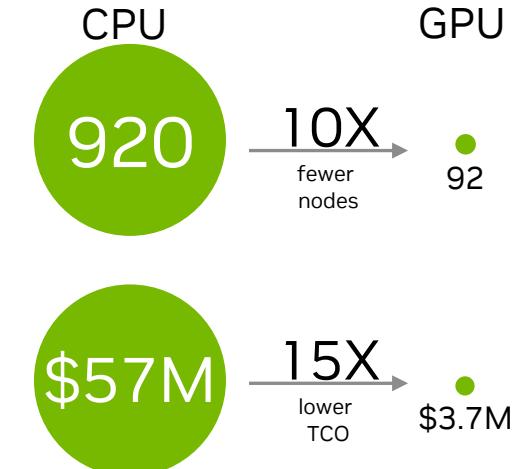


Driving Net Zero and Lowest TCO Accelerated Computing is Highly Efficient

NVIDIA Hopper
Compared to CPUs

26X

more **energy efficient** at MLPerf AI Inference



Left Panel: Geometric mean of application speedups vs. P100 | benchmark applications | Amber [PME-Cellulose NVE], Chroma [HMC], GROMACS [ADH Dodec], MILC [Apex Medium], NAMD [stmv_nve_cuda], PyTorch (BERT Large Fine Tuner), Quantum Espresso [AUSURF112-jR]; TensorFlow [ResNet-50], VASP 6 [Si Huge], GPU node: with dual-socket CPUs with 4x P100, V100, or A100 GPUs. H100 values shown for 2022 projected performance subject to change

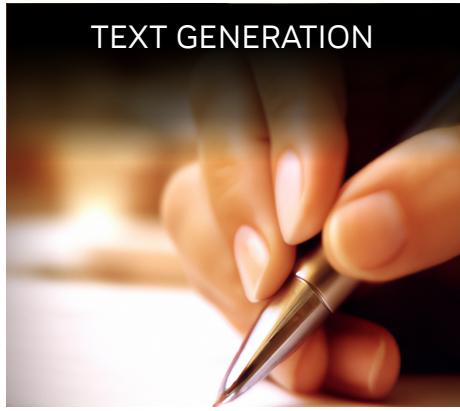
Center Panel: Per-chip performance is not a primary metric of MLPerf™ Training. All accelerator based on 8-chip submissions and closest chip count used for Intel Sapphire Rapids results, normalized to A100 | Format: Chip count, submitter, MLPerf ID | BERT: 8x NVIDIA 2.1-2091, 16x Intel 2.1-2089 | MLPerf™ name and logo are trademarks. See www.mlperf.org for more information.

Right Panel: Energy Efficiency based on re-production of latest commercially available A100 results and latest available CPU (Intel 8380) inference MLPerf (1.1) models. Scaling to H100 results with A100 vs H100 GPU results MLPerf (2.1) inference | Cost/Space comparison example based on latest available NVIDIA A100 GPU and Intel CPU inference results in the commercially available category of the MLPerf (1.1) industry benchmark

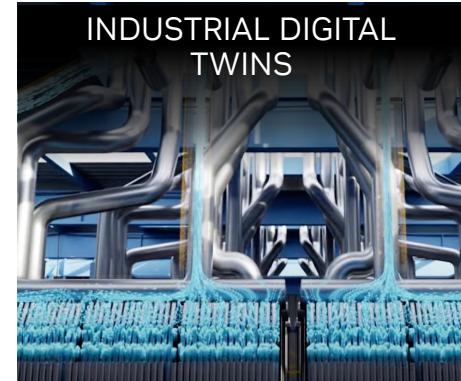
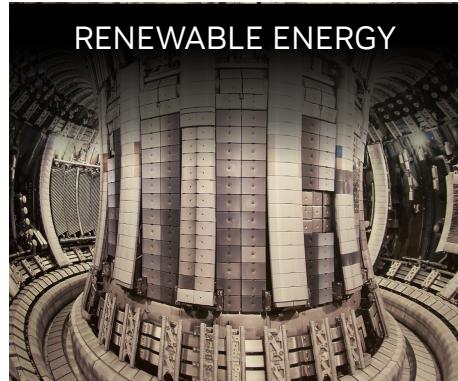
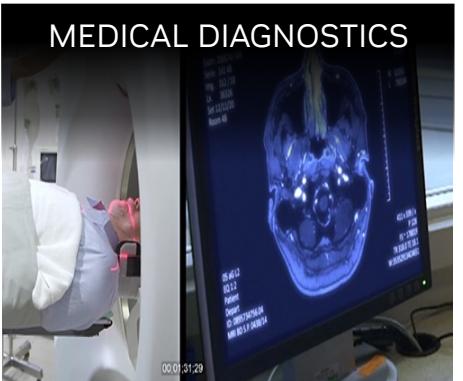
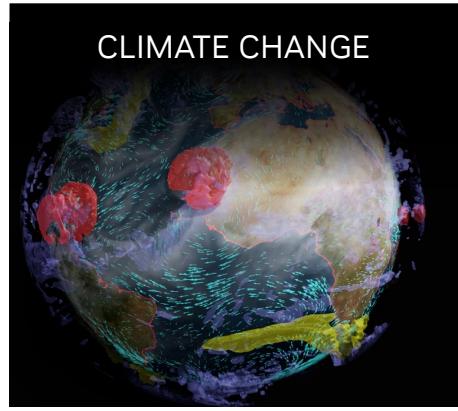
N-WAY GPU Bootcamp

https://github.com/openhackathons-org/nways_accelerated_programming/

AI



Scientific Computing (HPC)



OPENACC – CELEBRATING 11 YEARS

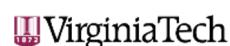
Building Community.



Ecosystem
Development

Training/Education

OpenACC Specification



H OPEN
HACKATHONS
OpenACC

OPEN HACKATHONS IN NUMBERS

Founded in 2014 under OpenACC Org Umbrella

500+

Applications accelerated

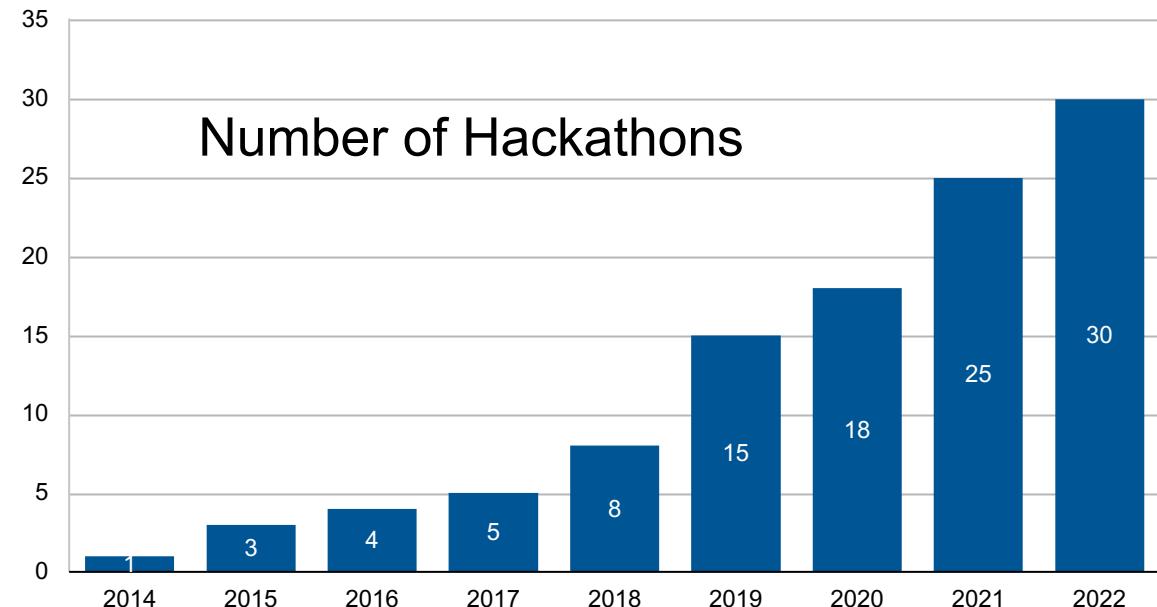
600+

Mentors contributed

Community

Compute Resources Provided

Founding members



www.openhackathons.org



HACKATHONS HIGHLIGHTS

Code	Domain	Result in 5 days
CHARMM	MD	7.5x on a kernel
LAVA(NASA)	CFD	10x on a mini-app
HiFUN	CFD	3.2x on a full app, 100x on a kernel
Yambo	QC	6x on a full app
CASTRO	Astro	14x on mini-app
Garnet	Earth Sciences	40x on mini-app
CGYRO	Physics	10x on a mini-app
CASTEP	QC	2.7x and 11x on 2 parts
NEMOLite2D	CWO	15x
GTS	Fusion	25x for the kernel and 3x for the overall app
Quantum Espresso	QC	6x

“ I'm a firm believer in **collaborative science**, and it was wonderful to see several of my graduate students and postdocs deeply engaged. The team made tremendous progress during the week, and that momentum has carried the project forward ever since. **In four days they managed to obtain a two-orders-of-magnitude increase in performance, and since then they've made further optimizations** that gained them another order of magnitude. This speedup has opened up an entirely new class of problems in quasistatic global geophysics. From my perspective, this was a very successful event! ”



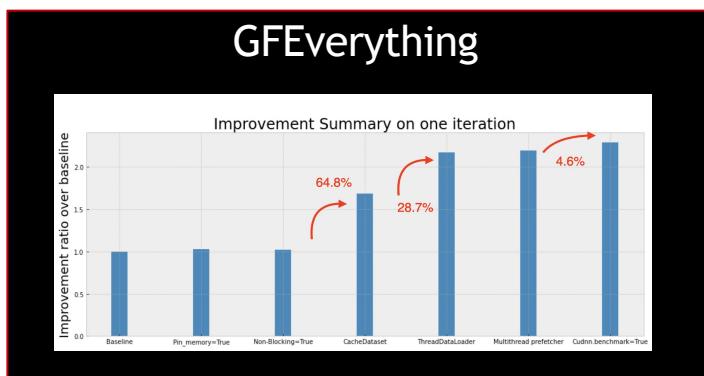
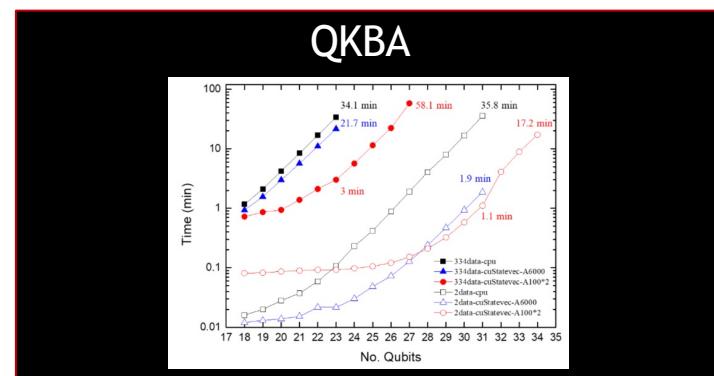
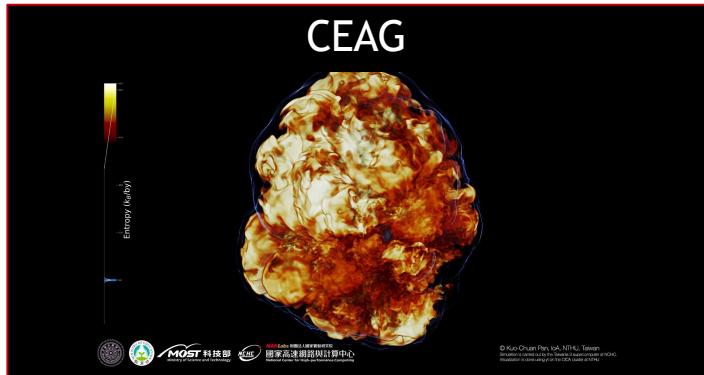
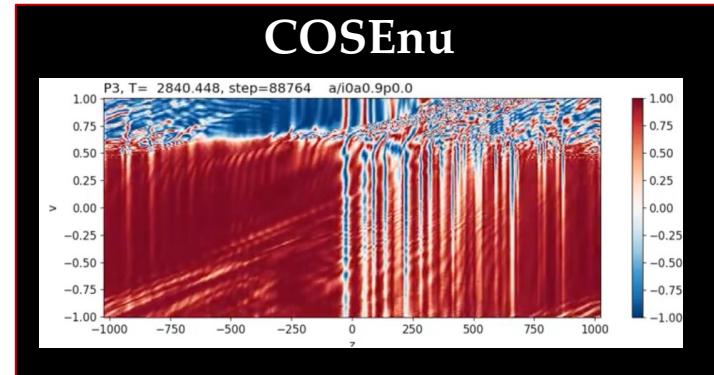
Jeroen Tromp, Blair Professor of Geology and Professor of Applied & Computational Mathematics at Princeton University



OpenACC

Hackathon Hosts

2022 NCHC OpenACC Hackathon



OPEN HACKATHONS AND BOOTCAMPS

Free to participate. Community driven. Designed to promote host sites.

Bootcamps – 1 or 2 days

- 1** Build confidence in Parallel Programming
- 2** Prepare for Open Hackathons
- 3** Materials can be used on any cluster

→ 1-2 months lead time



Hackathons – 4 days over 2 weeks

- 1** Accelerate users' codes on CPUs and GPUs
- 2** Learn from 2 dedicated mentors per team
- 3** Train computational and data scientists
- 4** Increase cluster utilization
- 5** Build collaborations
- 6** Create POCs for future use
- 7** Discover new AI use cases

→ 5 months lead time

www.openhackathons.org

OpenACC

07/28-29 N-WAY GPU Bootcamp

<https://www.openacc.org/events/nchc-n-ways-gpu-programming-bootcamp>



The NCHC, in collaboration with OpenACC organization and NVIDIA, is hosting the NCHC N-Ways bootcamp for one and a half days on July 27 and July 28, 2023.

During this bootcamp, participants will learn about multiple GPU programming models and can choose the one that best fits their needs to run their scientific codes on GPUs. This bootcamp will cover an introduction to GPU programming using OpenACC, OpenMP, stdpar, and CUDA C, and provides hands-on opportunities to learn how to analyze GPU-enabled applications using NVIDIA® Nsight™ Systems. This bootcamp is a hands-on learning experience where you will be guided through step-by-step instructions with teaching assistants on hand to help throughout.

APPLY NOW

Event Format

This bootcamp will be hosted with Day 1 (July 27) online and Day 2 (July 28) in-person and will be in the Taipei time zone. All communication will be done through Microsoft Teams and email.

Important Event Dates

NCHC N-Ways Bootcamp Application Deadline	July 04, 2023
NCHC N-Ways Bootcamp Day 1	July 27, 2023
NCHC N-Ways Bootcamp Day 2	July 28, 2023

Questions?

11/27-12/08 OpenACC Hackathon

<https://www.openhackathons.org/s/siteevent/a0C5e000005VZLiEAO/se000160>



Open Hackathons provide exciting opportunities for scientists to accelerate their AI or HPC research under the guidance of expert mentors from national laboratories, universities and industry leaders in a collaborative environment. Representing distinguished scholars and preeminent institutions around the world, these teams of mentors and attendees work together to realize performance gains and speedups using a variety of programming models, libraries and tools.

The goal of the Open Hackathon is for computational scientists to port, accelerate and optimize their scientific applications to modern computer architectures, including CPUs, GPUs and other computing technologies. Participating teams should leave the event either with their applications accelerated and/or optimized on the latest supercomputing hardware or a clear roadmap of the next steps needed to leverage these resources.

This Hackathon is open to everyone looking to take their projects to the next level; however, priority acceptance will be given to TWS/NCHC affiliated scientists and their collaborators.

If you would like to be notified when the call for applications is open, please click the button below.

NOTIFY ME

Important Event Dates

NCHC Open Hackathon 2023 Application Deadline	October 04, 2023
NCHC Open Hackathon 2023 Team/Mentor Meeting	November 27, 2023
NCHC Open Hackathon 2023 Day 1	November 27, 2023
NCHC Open Hackathon 2023 Day 2	December 06, 2023

2023 NCHC-NVIDIA Events



Call for Speaker

<https://www.oacsummit.org/s/>

Call for Speakers is Now Open

Deadline to submit is June 28, 2023 at 11:59 PM PT.

**Start New
Submission**

**Edit Draft
Submission**

If you have any questions, please contact us at events@openacc.org

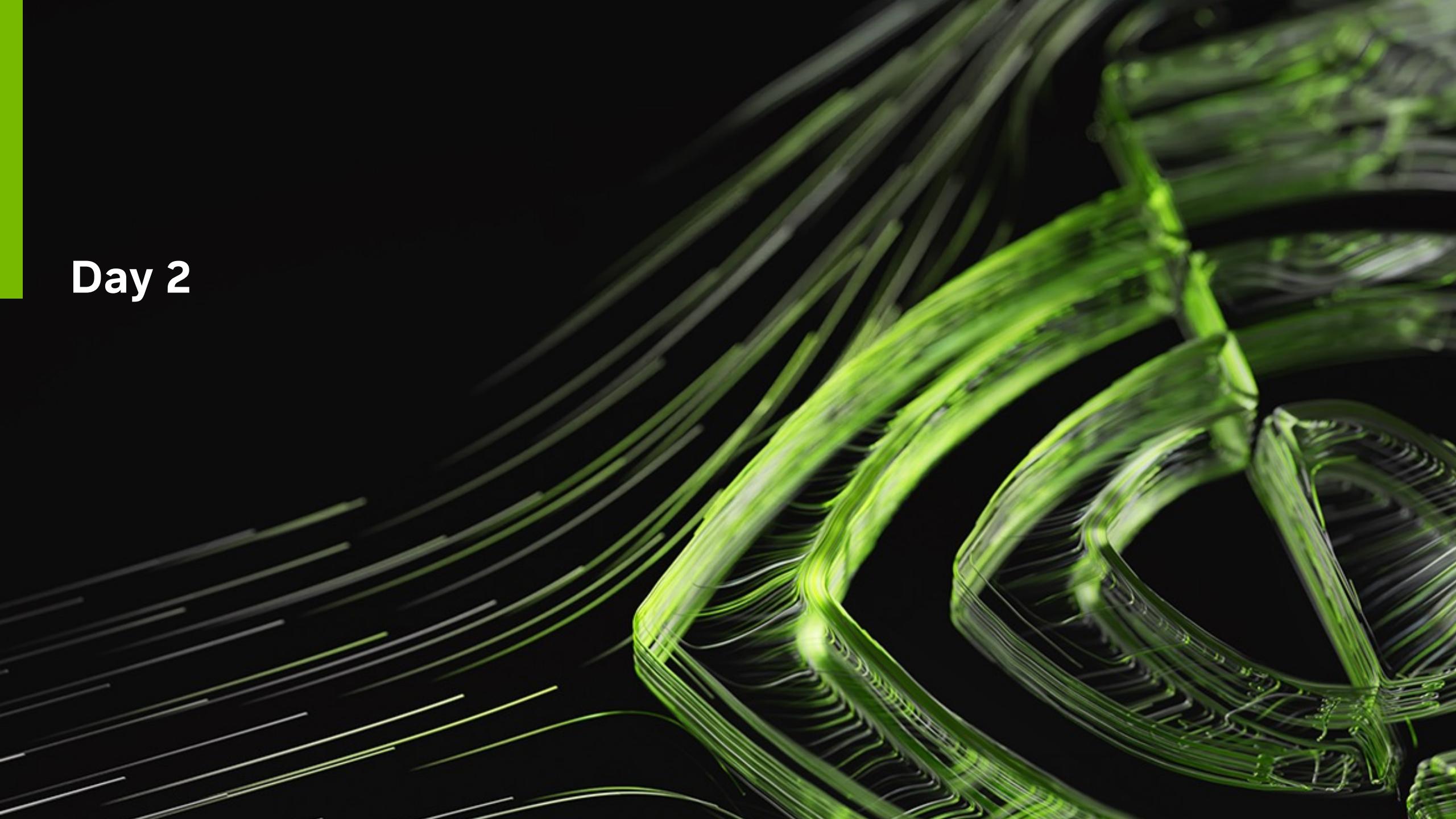
Topics for Discussion

1. Accelerating Scientific Computing
2. Application of Computer Vision
3. Deep Learning (Model Optimization, Training, Inferencing)
4. Experiences from Hackathons
5. Experiences Porting Scientific Applications to Modern Compute Systems
6. Interoperability with Directive-based Models
7. Libraries and Frameworks for HPC and AI
8. Natural Language Processing and Automatic Speech Recognition
9. Performance Modeling and Benchmarking
10. Physics-informed Neural Networks
11. Using Standard Language Parallelism
12. Others

Acceptance Criteria

Submissions are selected based on the following criteria:

- Technical details, performance results offered, and insights learned.
- Relevance and alignment of the presentation to the OpenACC focus areas.
- Presenter's credentials and subject matter expertise.
- Presenter's public speaking experience(s).

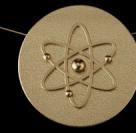
The background of the slide features a dark, almost black, surface. Overlaid on this are numerous thin, glowing green lines. These lines are highly dynamic, creating a sense of motion and depth. They form a complex, interconnected structure that resembles a twisted ribbon or a series of nested loops. The intensity of the glow varies along the length of each line, with some appearing bright and others more muted. The overall effect is futuristic and energetic.

Day 2

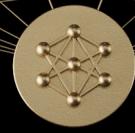


AI APPLICATION
FRAMEWORK

PLATFORMS



NVIDIA
SCIENTIFIC
COMPUTING
(HPC)



NVIDIA
AI



NVIDIA
Omniverse

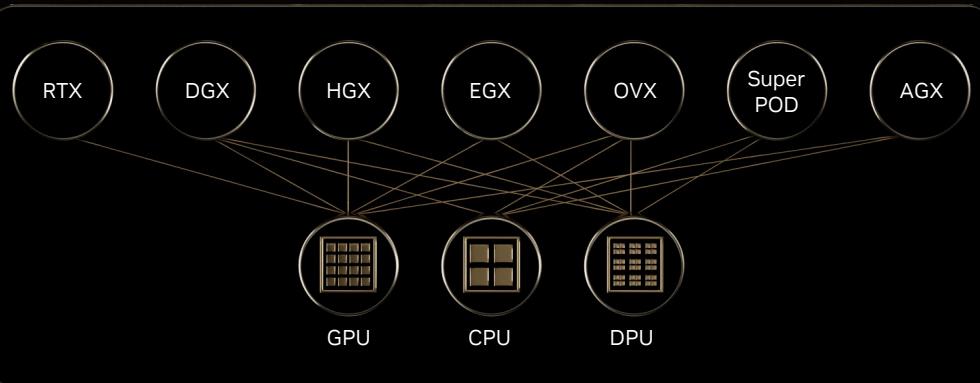
ACCELERATION
LIBRARIES



**3.5 M
Developers**

CLOUD-TO-EDGE
DATACENTER-TO-ROBOTIC SYSTEMS

3 CHIPS





NVIDIA Developer Program

The Community that Builds

Program Benefits:

Tools

- 550+ exclusive SDKs and models
- GPU-optimized software, model scripts, and containerized apps
- Early access programs

Training

- Research papers, technical documentation, webinars, blogs, and news
- Technical training and certification opportunities
- 1,000s of technical sessions from industry events On-Demand

Community

- NVIDIA developer forums
- Exclusive meetups, hackathons, and events

Join the Community



* The Hardware Grant Program is available to qualified researchers and educators.



Agenda – Day 2 (Physical)

- 09:50 ~ 10:00 : ☺☺☺ Welcome & Group Photo ☺☺☺
- 10:00 ~ 12:00 : [Lab] CUDA C/Fortran Programming
- 12:00 ~ 13:00 : ☺☺☺ Lunch Break ☺☺☺
- 13:00 ~ 16:00 : [Code challenge]
- 16:00 ~ 16:30 : Wrap up and QA



Virtual Event
November 27, December 6 - 8, 2023
Application Deadline: October 4, 2023

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2023 11/27-12/08 OpenACC Hackathon

<https://www.openhackathons.org/s/siteevent/a0C5e000005VZLiEAO/se000160>

3-Minute Feedback Survey

<https://forms.gle/xKF1Nsr5mDtLjKGF8>



20230728 Feedback Survey - N-WAY GPU Bootcamp

登入 Google 即可儲存進度。瞭解詳情

* 表示必填問題

電子郵件 *

你的電子郵件

活動整體印象評分 *

1

2

3

4

5

很糟

很讚

今日Labs哪些技術對您有幫助？（複選） *