HACKATHONS

Latest Updates and Future Plans

OpenACC
More Science, Less Programming

COMMUNITY GPU HACKATHONS IN NUMBERS

Founded in 2014 under OpenACC Org Umbrella
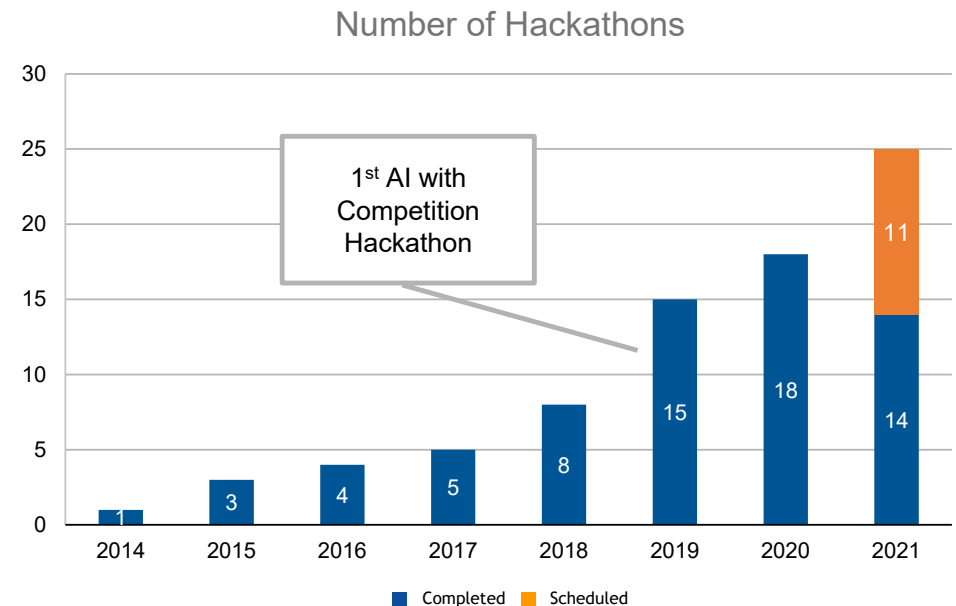
400+
Applications accelerated

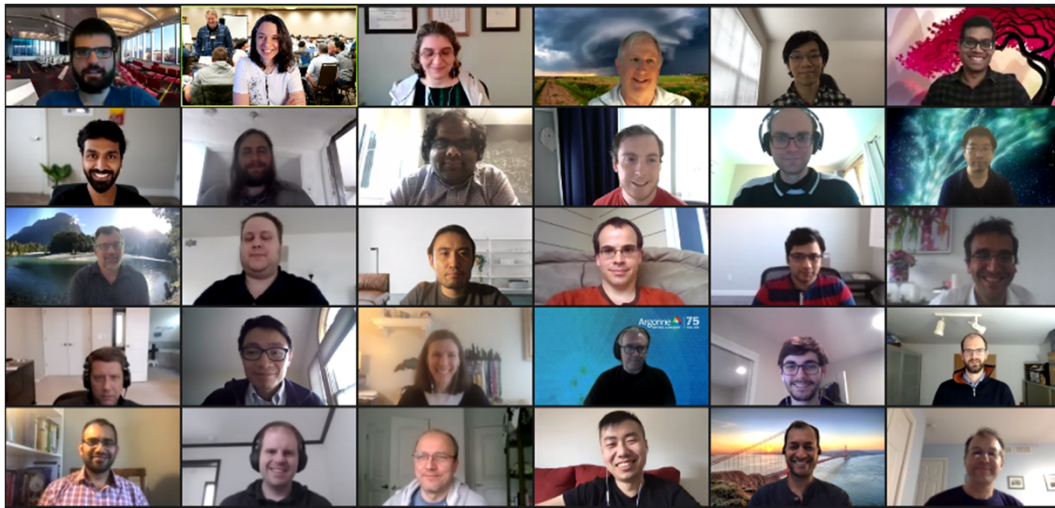**Community**
Mentors and Compute Resources

Founding members

OAK RIDGE National Laboratory

NERSC

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

CSCS

Number of Hackathons

1st AI with Competition Hackathon

Year	Completed	Scheduled
2014	1	
2015	3	
2016	4	
2017	5	
2018	8	
2019	15	
2020	18	
2021	14	11

■ Completed ■ Scheduled

www.gpuhackathons.org

GPU HACKATHONS
OpenACC

FIRST ARGONNE GPU Hackathon

April 20, 27-29, 2021

"Learned a lot and achieved a lot of our goals"
"Instant help was fantastic; mentors were extremely useful!"
"Hackathon itself, hugely helpful. Getting a GPU to work on was almost always immediate."

Participants:
13 teams /14 codes (11 HPC, 3 AI)

Codes: MOAB, XPINN, scalable brain simulator, Uno, WEST, Qbox, ptychopy, PIRT, Parthenon, cuSZ, 4DCrystal & 4DClassify, p2r, NWChemEx, 2DHypersonics

Domains:
molecular dynamics, aerodynamics, high energy physics, STEM, imaging, climate, neuroscience

Programming models: CUDA, OpenACC, Kokkos, TensorFlow, RAPIDS, C++ std::par

Profiling Tools: Nsight and DLProf

Results:
up to 300x speed-up and scaled codes up to 64 GPUs

Mentors:
ANL, NVIDIA, OLCF, NERSC, UTK

GPU HACKATHONS
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COMMUNITY GPU HACKATHONS AND BOOTCAMPS

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

Hackathons – 4 days over 2 weeks	
1	Accelerate users' codes on GPUs
2	Train GPU professionals
3	Increase GPU Cluster Utilization
4	Build collaborations
6	Create POCs for future use
7	Discover new AI use cases

Bootcamps – 1 or 2 days	
1	Build confidence in GPU Programming
2	Prepare for GPU Hackathons
3	Materials can be used on any cluster

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GPU HACKATHONS
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BOOTCAMP MATERIALS

HPC

1- Available now

OpenACC GPU Bootcamp
Prerequisites: basic experience with C/C++ or Fortran. No GPU Programming knowledge is required.
Tools: OpenACC, NVIDIA HPC SDK,Nsight
Domain: CFD/Weather Simulation

2- Available now

N-ways GPU Bootcamp
Prerequisites: basic experience with C/C++ or Fortran. No GPU Programming knowledge is required.
Tools: OpenACC, OpenMP, CUDA, C++ stdpar, Kokkos, cuPy, numda, NVIDIA HPC SDK, Nsight
Domain: CFD, MD

3 - Available now

Multi GPU Programming for HPC
Tools: MPI, NVSHMEM, NCCL

HPC + AI

1- Available now

AI for Science GPU Bootcamp
Prerequisites: Basic experience with Python. No GPU programming or AI knowledge is required.
Tools: TensorFlow, Keras, SimNet
Domain: Weather (pattern recognition) and CFD (data based/boundary condition) + more to be added

AI/Data Science

3 - Available now

DeepStream
RAPIDS
Distributed Deep Learning

In Development

Riva

Materials are available on community GitHub:
https://github.com/gpuhackathons-org/gpubootcamp

8 hours worth of content per topic
Free to use on any cluster

GPU HACKATHONS
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SUPPORT AND RESOURCES

Available for all hosting sites

Hackathons & Bootcamps	Bootcamp Materials	GPU Cluster	Website
Help Organize Mentor Moderate HPC, HPC+AI, AI Calendar of GPU Hackathons and Bootcamps	HPC HPC+AI AI and Data Science https://github.com/gpuhackathons-org/gpubootcamp	Community GPU clusters 10 DGX1s at NVIDIA Depending on availability	www.gpuhackathons.org Information Application Registration Open resource to be used for any hackathon or bootcamp

OpenACC

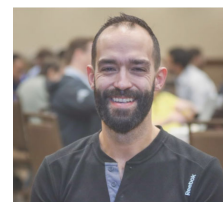# MENTOR AT A HACKATHON

WHY

- Start new collaborations
- Learn how GPU technologies are used in real-life projects
- Hone GPU programming skills

HOW

- Commit 4 days(4-8 hours a day) over zoom over 2 weeks
- Support on Slack for tool/product questions
- Guide teams to success, do not do all the work

"First and foremost, I like the GPU Hackathons. I think they are a fun environment to push productivity that you do not get in a normal workday...Second, I like the exposure to different domains and sciences that I never would have seen otherwise. I also like the exposure to different styles of coding. There's not just one way to write a Fortran or C++ code... More than anything, I do really enjoy taking something that another person views as complex and making it more approachable, down to earth and practical."

Matthew Norman, OLCF

Sign up here: www.gpuhackathons.org/become-mentor.
Mentor certification is now available for HPC and AI focus.

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FUTURE PLANS – COMMUNITY HACKATHON PROGRAM

Open Hackathons will Replace **GPU** Hackathons

Grow Beyond **GPU** Technologies

Include Networking, CPU and GPU Technologies

Rebrand www.GPUHackathons.org to www.OpenHackathons.org by SC21

GPU HACKATHONS

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New OpenACC Org Hackathon Membership

1. Support to hackathon hosting organizations
2. Help early career scientists
3. Reward mentors and event participants
4. Contribute back to communities

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