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HCMUT HPC SUMMER SCHOOL
START LOCAL, COMPUTE AT SCALE

HCMUT HPC Summer School 2026

Start Local, Compute at Scale

17–19 June 2026
Ho Chi Minh City University of Technology, VNU-HCM

School Report

School Organization Board

27 June 2026

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Abstract

HCMUT HPC Summer School 2026 was a three-day intensive academic program designed to introduce students to High Performance Computing through a practical, hands-on learning model. The school brought together lectures, guided technical sessions, cluster-based exercises, AI/HPC workflows, reproducible environments, LLM infrastructure concepts, and a final mini hackathon. Organized by the High Performance Computing Lab at Ho Chi Minh City University of Technology, VNU-HCM, in collaboration with the Faculty of Computer Science and Engineering and Big Data Club, the program received 125 valid applications from students across 11 universities. From this applicant pool, 36 students were selected to join the program, and 31 students completed the program requirements and received certificates of participation. This school report summarizes the motivation, curriculum, learning model, participant experience, hackathon outcomes, community engagement, and future directions for the school.

Contents

1 Executive Summary

HCMUT HPC Summer School 2026 was a three-day intensive academic program designed to introduce students to High Performance Computing through a practical, hands-on learning model. The school brought together lectures, guided technical sessions, cluster-based exercises, AI/HPC workflows, reproducible environments, LLM infrastructure concepts, and a final mini hackathon.

The program was organized by the High Performance Computing Lab and Faculty of Computer Science and Engineering at Ho Chi Minh City University of Technology, VNU-HCM, in collaboration with the Big Data Club, Agentivium AI, Data Science Lab, TIST Lab and other academic units. The school was supported by a student organizing committee, teaching assistants, technical supporters, lecturers, invited speakers, and GreenNode.AI as the industry partner.

The school received 125 valid applications from students across 11 universities. From this applicant pool, 36 students were selected to join the program. By the end of the school, 31 students completed the program requirements and received certificates of participation.

The curriculum was designed around the theme **"Start Local, Compute at Scale."** Students began with fundamental HPC concepts and gradually moved toward practical cluster usage, resource management, parallel programming, AI workloads, containerized reproducible experiments, LLM serving, and agentic AI infrastructure. The final mini hackathon gave students an opportunity to apply what they learned in a team-based technical challenge.

Post-school feedback indicated that participants strongly valued the practical nature of the program. Students particularly highlighted Slurm job management, AI/HPC workflows, reproducible environments, and the support from teaching assistants and technical supporters as important parts of their learning experience. Feedback also showed strong interest in future advanced HPC and AI infrastructure activities.

Beyond technical training, HCMUT HPC Summer School 2026 served as a starting point for building a student-centered HPC community. The final afternoon connected students with international HPC education perspectives, ACM community pathways, ASEAN HPC School experiences, and faculty reflections on how students can continue developing beyond the school.

2 Why This School

High Performance Computing is becoming increasingly important for modern computing. AI, scientific simulation, large-scale data processing, computer vision, data-intensive research, and emerging agentic workloads all depend on the ability to use computing resources efficiently and reproducibly.

However, for many undergraduate students, HPC remains difficult to access. It is not enough to understand programming or machine learning in isolation. Students also need to understand

how workloads are submitted, scheduled, containerized, monitored, scaled, and evaluated on shared infrastructure.

HCMUT HPC Summer School 2026 was created to address this gap. The school was designed to give motivated students an early but practical entry point into HPC systems, tools, and workflows. Instead of presenting HPC as an abstract topic, the program focused on how students can interact with real computing environments and reason about the relationship between code, resources, runtime behavior, and reproducibility.

The school also responded to a broader educational need. As AI systems become more compute-intensive, students need to understand not only models and algorithms, but also the infrastructure that enables those models to run at scale. This includes resource-aware execution, GPU workloads, containerized environments, distributed workflows, and responsible use of shared computing systems.

The school therefore had three main goals:

1. **Introduce students to practical HPC concepts and workflows.**
   Students learned about HPC systems, cluster usage, Slurm, parallel programming, GPU workloads, reproducible experiments, and LLM infrastructure.
2. **Connect HPC with modern AI and data-intensive workloads.**
   The curriculum positioned HPC not as a standalone systems topic, but as a foundation for AI, deep learning, LLM serving, and future agentic workloads.
3. **Build the foundation for a student HPC community.**
   The school created a first cohort of students, volunteers, teaching assistants, and organizers who can continue developing HPC-related activities after the program.

The guiding theme of the school was:

> **Start Local, Compute at Scale.**

This theme reflects the intended learning path: students may begin with local programming experience, but modern computing increasingly requires them to think in terms of shared infrastructure, reproducible workflows, scalable execution, and community-based technical practice.

3 Program at a Glance

HCMUT HPC Summer School 2026 was organized as a compact, hands-on, three-day program.

Table 1: Program summary at a glance.

Item	Summary
Program duration	3 days
Dates	17–19 June 2026
Valid applications	125
Universities represented in applications	11
Selected students	36
Students completing program requirements	31
Student organizing committee	16 members
Lecturers and instructors	11 members
Mini hackathon	1 team-based challenge
Main format	Lectures, hands-on sessions, demos, team challenge, community sharing

The program was supported by a multi-layered organization model. Academic leadership provided direction for the school's curriculum and technical scope. Lecturers and instructors led the main academic sessions. Teaching assistants and technical supporters helped students during hands-on activities. Big Data Club supported student-facing operations, communication, logistics, and event execution.

GreenNode.AI joined the program as a partner, contributing an industry perspective on cloud computing infrastructure for AI and HPC. This helped connect the academic training program with real-world infrastructure and career pathways.

The school was intentionally designed to be selective but accessible. The large applicant pool showed strong student interest in AI, HPC, and large-scale computing. The selected cohort represented students who were ready to engage with an intensive, hands-on technical program.

Post-school feedback reinforced the value of this model. Students reported that the most useful parts of the school were practical, infrastructure-oriented topics: working with Slurm, running AI/HPC workflows, using reproducible environments, understanding performance behavior, and receiving hands-on support from teaching assistants.

4 Curriculum Overview

The curriculum of HCMUT HPC Summer School 2026 was organized around a progressive learning path. Students moved from HPC foundations to applied workloads, then to a final integration challenge.

4.1 Day 1 - HPC Foundations

The first day introduced students to the basic concepts and tools needed to work with HPC systems.

Main sessions:

- Opening Ceremony
- Partner Introduction - GreenNode.AI
- School Orientation
- Introduction to High Performance Computing
- Introduction to HPC Cluster and Resource Management
- Parallel Computing with OpenMP and MPI
- Performance Trade-offs in Parallel Computing

The first day helped students understand what HPC is, why resource management matters, and how parallel computing changes the way programs behave. Students were introduced to cluster concepts, job submission, and the basic mindset required to work with shared computing resources.

4.2 Day 2 - AI Workloads and Reproducibility

The second day connected HPC systems with modern AI workflows.

Main sessions:

- Digital Image Processing and Deep Learning in Computer Vision
- AI Workloads on HPC: Resource-Aware GPU Request
- Reproducible HPC Experiments with Apptainer
- LLM Serving, Multi-Agent Systems, and AI Infrastructure

This day emphasized that AI workloads are not only about models. They also depend on resource requests, GPU usage, reproducible environments, software stacks, runtime behavior, and infrastructure design. Students were introduced to practical workflows for running AI-related tasks on HPC resources.

4.3 Day 3 - Mini Hackathon and Community Sharing

The third day served as both an integration activity and a community-building day.

Main activities:

- Mini Hackathon
- From Summer School to Student HPC Community
- ACM Support for Students and HPC Schools
- Top Team Presentations
- International HPC Infrastructure Perspective
- Introduction to ACM Global Engagement Board
- ACM Student Chapter and ASEAN HPC School Experience
- Remarks from Faculty of Computer Science and Engineering
- Awards, Certificates, and Closing Remarks
- Group Photo and Next Steps

The mini hackathon allowed students to apply what they had learned in a team-based setting. The afternoon program broadened the school from a technical training event into a discussion about long-term student development, HPC education, international communities, and professional pathways.

5 Hands-on Learning Model and Student Feedback

HCMUT HPC Summer School 2026 was designed as a hands-on learning program. The school did not treat HPC as a purely theoretical topic. Instead, the curriculum encouraged students to interact with tools, workflows, and infrastructure.

The learning model followed a simple progression:

Concept → Tool → Cluster Practice → Reflection → Team Challenge

Each technical topic introduced a core concept, followed by practical exposure to tools or workflows. Students were guided through cluster usage, resource management, parallel computing, reproducible environments, AI workloads, and LLM infrastructure concepts. The final mini hackathon then gave students an opportunity to combine these elements in a team challenge.

Post-school feedback showed that students valued this practical structure. The most useful learning areas included:

- Linux command-line usage and Slurm job management
- AI and deep learning workflows on HPC resources
- Docker/Apptainer-style reproducible environments
- OpenMP and MPI concepts
- Debugging, optimization, and system-level reasoning
- Understanding how workloads behave on shared infrastructure

A key learning outcome was not simply that students were exposed to individual tools. More importantly, students began to understand how code, resource requests, runtime behavior, environment management, and reproducibility are connected in real HPC workflows.

The strong appreciation for teaching assistants and technical supporters also showed the importance of human support in a hands-on HPC school. In a practical computing environment, students often need immediate guidance when facing issues related to accounts, commands, job scripts, environment setup, or workload behavior. The TA and technical support layer helped make the intensive format more accessible.

The survey also suggested that future editions should continue improving learning scaffolds. Students valued hands-on work, but also indicated that earlier preparation materials, clearer lab steps, and more time for practical exercises would make the learning path even stronger.

6 Participants, Outreach, and Learning Experience

HCMUT HPC Summer School 2026 attracted strong interest from students across multiple universities. The school received 125 valid applications from 11 universities, reflecting a clear demand for practical HPC education among students in computer science, engineering, AI, and related fields.

The applicant pool showed particularly strong interest in AI/ML and HPC/parallel computing. This confirmed the relevance of the school's curriculum direction: students are increasingly interested in AI, but they also recognize the importance of infrastructure, resource management, and scalable computing.

The selected cohort included students with different levels of prior preparation. Some students were already comfortable with Linux, AI, or programming, while others had less exposure

to parallel programming or HPC systems. This diversity of background shaped the school's design. The program needed to remain accessible to students who were new to HPC, while still providing enough depth for students who wanted more advanced technical content.

Post-school feedback confirmed the importance of this scaffolded approach. Students entered the school with uneven exposure to HPC-related topics, especially parallel programming and system-level workflows. The hands-on format helped bridge this gap by allowing students to learn through guided interaction with tools and infrastructure.

The school also created a shared student experience. Participants were not only attending lectures; they were working with job scripts, asking technical questions, interacting with TAs, collaborating in teams, and presenting results. This combination of technical training and peer interaction helped form the first cohort of students connected through the HCMUT HPC Summer School experience.

For future editions, this participant profile suggests that the school can continue serving as an entry point into HPC, while also developing advanced tracks or follow-up activities for students who want to go deeper into AI infrastructure, distributed workloads, GPU computing, profiling, and reproducible research.

7 Mini Hackathon and Student Recognition

The Mini Hackathon was the main integration activity of HCMUT HPC Summer School 2026. It was designed to encourage students to apply concepts from the previous sessions in a team-based technical challenge.

The hackathon emphasized practical problem solving rather than isolated theory. Students worked in teams and were expected to use what they had learned about HPC workflows, resource-aware execution, AI infrastructure, and reproducible environments. The challenge required students to think about how to structure their work, use available resources, coordinate within a team, and present their approach.

Post-school feedback indicated that students viewed the hackathon as meaningful and appropriately challenging. It served as a way to consolidate the learning experience and helped students connect individual technical sessions into a more complete workflow.

The top hackathon teams were recognized during the closing session.

Table 2: Hackathon team recognition.

Recognition	Team
Hackathon 1st Place	Team 04
Hackathon 2nd Place	Team 05
Hackathon 3rd Place	Team 02

In addition to team recognition, four students were recognized as Top 10% performers based on their overall performance across the school.

The Mini Hackathon also provided useful direction for future editions. It showed that students are ready to engage with practical AI/HPC challenges, especially when the problem is connected to real infrastructure and modern workloads. Future editions can continue refining the hackathon format through clearer examples, staged preparation, and stronger links between the technical sessions and the final challenge.

8 Community and International Engagement

The final afternoon of HCMUT HPC Summer School 2026 connected the technical training program with broader community and international perspectives.

The afternoon began with a sharing session on how the school could become a starting point for a student HPC community. This framing helped students see the school not as a one-time event, but as the beginning of a longer pathway involving learning, community participation, research, and professional development.

The program also included international and community-oriented sessions:

- **ACM Support for Students and HPC Schools**
  Prof. Fabrizio Gagliardi shared an international perspective on HPC education and ACM support for student activities.
- **Top Team Presentations**
  Selected student teams presented their hackathon outcomes, giving participants an opportunity to learn from peer solutions and communication styles.
- **International HPC Infrastructure Perspective**
  Dr. Chung Thanh Minh from the Leibniz Supercomputing Centre provided an international perspective on HPC infrastructure and related research directions.
- **Introduction to ACM Global Engagement Board**
  George Neville-Neil introduced ACM Global Engagement and discussed pathways for student involvement in professional computing communities.

- **ACM Student Chapter and ASEAN HPC School Experience**
  Prof. Worawan Diaz Carballo shared experiences from ACM student chapter activities and ASEAN HPC School, highlighting how student communities can grow through sustained effort and mentorship.
- **Remarks from Faculty of Computer Science and Engineering**
  Faculty remarks connected the school to the broader educational mission of HCMUT and the Faculty of Computer Science and Engineering.

This final afternoon was important because it extended the school beyond technical training. Students were exposed to examples of community building, international collaboration, professional organizations, and long-term development pathways.

Post-school feedback also showed strong interest in follow-up activities. Students expressed interest in more advanced HPC content, deeper AI/LLM workloads, longer hands-on formats, and continued community-based learning opportunities. This supports the direction of developing HCMUT HPC Summer School into a continuing student HPC pathway.

9 Outcomes and Impact

HCMUT HPC Summer School 2026 produced outcomes at multiple levels: student learning, community development, institutional capacity, and future collaboration.

9.1 Student Learning Outcomes

Students gained introductory hands-on experience with practical HPC workflows. Across the three-day program, students were exposed to:

- HPC systems and architecture
- Cluster usage and resource management
- Slurm job management
- OpenMP and MPI concepts
- AI workloads on HPC resources
- GPU workload behavior
- Reproducible environments with Apptainer
- LLM serving and AI infrastructure concepts
- Team-based technical problem solving through a mini hackathon

Post-school feedback showed that students valued the practical and infrastructure-oriented nature of the curriculum. In particular, students recognized the usefulness of Slurm, AI/HPC workflows, reproducible environments, and system-level debugging.

9.2 Community Outcomes

The school created a first cohort of students connected through a shared HPC learning experience. It also strengthened collaboration between HCMUT HPC Lab, Faculty of Computer Science and Engineering, Big Data Club, lecturers, teaching assistants, student volunteers, partners, and invited guests.

The student organizing model was an important part of the program. Big Data Club and the student committee supported logistics, communication, student experience, technical program operations, and hackathon execution. This demonstrated that a student-supported model can play a meaningful role in operating a hands-on technical school.

9.3 Institutional Outcomes

For HCMUT HPC Lab and the Faculty of Computer Science and Engineering, the school provided a compact model for practical HPC education. The program showed that a three-day format can introduce students to cluster-based computing, AI/HPC workflows, reproducibility, and community pathways when supported by strong preparation and technical guidance.

The school also created reusable experience for future editions: curriculum structure, session formats, hands-on materials, operational workflows, student support practices, and hackathon design.

9.4 International and Professional Community Outcomes

The participation of international speakers and ACM-related guests helped connect students with broader computing communities. Students were introduced to pathways involving ACM, student chapters, regional HPC schools, international infrastructure perspectives, and long-term community development.

This connection is important for sustaining student interest after the school. HPC education is not only about learning tools; it also requires mentorship, community, access to infrastructure, and opportunities to participate in larger professional networks.

10 Acknowledgements and Looking Forward

HCMUT HPC Summer School 2026 was made possible through the combined efforts of academic leaders, lecturers, instructors, teaching assistants, technical supporters, student volun-

teers, invited speakers, partners, and participants.

The organizing team would like to acknowledge:

- **High Performance Computing Lab, HCMUT, VNU-HCM** for academic direction, HPC infrastructure, technical leadership, and the long-term vision behind the school
- **Faculty of Computer Science and Engineering, HCMUT, VNU-HCM** for institutional support and for connecting the school with the broader educational mission of the Faculty
- **Big Data Club, HCMUT, VNU-HCM** for student organization, communication, logistics, participant support, event operations, and volunteer coordination throughout the program
- **GreenNode.AI** for supporting the school as an industry partner and for bringing an industry perspective on cloud computing infrastructure for AI and HPC
- **Agentivium AI, Data Science Lab, TIST Lab and Center for Computing Engineering, HCMUT, VNU-HCM** for contributing ideas, technical directions, and teaching assistant support related to AI infrastructure, LLM workflows, and agentic computing themes in the school
- **Assoc. Prof. Dr. Thoai Nam**, School Director, for providing academic leadership, financial support, and institutional guidance that helped make the first edition of the school possible
- **MEng. Hoang Le Hai Thanh**, Program Coordinator, for initiating HCMUT HPC Summer School, shaping its academic and community vision, coordinating the program structure, and connecting HPC education with AI infrastructure and future student pathways
- **MSc. Nguyen Manh Thin** and the HPC systems team for preparing and supporting the technical environment that enabled students to interact with real HPC workflows
- **Lecturers and instructors** for designing and delivering the technical sessions across HPC foundations, cluster management, parallel computing, AI workloads, reproducible environments, LLM serving, and AI infrastructure
- **Teaching assistants and technical supporters** for enabling the hands-on learning experience. Their support helped students navigate practical challenges in cluster access, job execution, environment setup, debugging, and team-based work

The organizing team is especially grateful to the invited speakers and international community supporters:

- **Prof. Worawan Diaz Carballo** and her students from Thammasat University ACM SIGHPC Student Chapter for supporting the school from its early ideation stage, helping connect HCMUT HPC Summer School with ACM, the international HPC community, and her student team. Her sharing on ACM student chapters, ASEAN HPC School activities, and student-led HPC communities helped students see how passion, competence, mentorship, and sustained community effort can grow into regional HPC initiatives

- **Prof. Fabrizio Gagliardi and his team** for helping amplify the spirit of HCMUT HPC Summer School within ACM, and for supporting the school through ACM digital engagement and encouragement for student-centered HPC education
- **George Neville-Neil** for joining the school onsite, introducing the ACM Global Engagement Board, and sharing perspectives on how students can connect with professional computing communities beyond a single event
- **Dr. Chung Thanh Minh** from the Leibniz Supercomputing Centre for contributing an international HPC infrastructure perspective and for connecting students with broader directions in HPC, quantum computing, AI-driven co-design, and advanced computing systems
- **The Faculty representative from the Faculty of Computer Science and Engineering** for joining the closing session and reinforcing the role of the school within the academic and student development mission of the Faculty

The organizing team also thanks all student participants for their active engagement, teamwork, technical curiosity, and post-school feedback. Their participation shaped the first edition of HCMUT HPC Summer School and provided valuable direction for future activities.

Looking forward, HCMUT HPC Summer School can continue developing in several directions.

First, future editions can strengthen preparation before the school by providing earlier onboarding materials for Linux, SSH, Slurm, reproducible environments, and expected laptop setup. This would help students begin the first day with fewer technical barriers.

Second, the hands-on learning path can be further improved through clearer lab scaffolding, expected outputs, common error guides, and optional advanced extensions. This would allow the school to support both beginners and stronger students within the same program.

Third, future editions can expand advanced content in AI/HPC workflows, distributed AI and LLM workloads, GPU execution, profiling, and reproducible research. Post-school feedback indicated strong student interest in these areas.

Fourth, the school can continue building a student HPC community at HCMUT by connecting participants with follow-up workshops, reading groups, project opportunities, student chapters, regional HPC schools, and international communities.

HCMUT HPC Summer School 2026 established a strong first step: a practical, student-centered, community-supported model for introducing modern HPC to students. The next stage is to turn this first cohort and first edition into a sustained pathway for HPC education, AI infrastructure learning, and student community development.

A Final Public Agenda Summary

A.1 Day 1 - 17 June 2026

Table 3: Day 1 public agenda.

Time	Segment	Speaker / Lead	Format
07:30–07:45	Check-in	Organizing Team	Onsite
07:45–08:00	Opening Ceremony	HPCC / Faculty of CSE	Opening
08:00–08:10	Partner Introduction - GreenNode.AI	GreenNode.AI / Organizing Team	Partner introduction
08:10–08:30	School Orientation	Program Coordinator	Briefing
08:30–09:30	Introduction to High Performance Computing	Assoc. Prof. Dr. Thoai Nam	Lecture
09:45–11:30	Introduction to HPC Cluster and Resource Management	Nguyen Manh Thin	Lecture + hands-on
13:30–15:00	Parallel Computing with OpenMP and MPI	Dr. Diep Thanh Dang	Lecture + hands-on
15:15–17:00	Performance Trade-offs in Parallel Computing	Dr. Diep Thanh Dang	Lecture + hands-on

A.2 Day 2 - 18 June 2026

Table 4: Day 2 public agenda.

Time	Segment	Speaker / Lead	Format
07:30–09:00	Digital Image Processing and Deep Learning in Computer Vision	MEng. Doan Ngo Duc Phuong	Lecture
09:15–11:30	AI Workloads on HPC: Resource-Aware GPU Request	MEng. Hoang Le Hai Thanh / Technical Team	Lecture + hands-on
13:30–15:00	Reproducible HPC Experiments with Apptainer	MEng. Bui Xuan Giang	Lecture + hands-on
15:15–17:00	LLM Serving, Multi-Agent Systems, and AI Infrastructure	MEng. Hoang Le Hai Thanh	Lecture + demo

A.3 Day 3 - 19 June 2026

Table 5: Day 3 public agenda.

Time	Segment	Speaker / Lead	Format
07:30–11:30	Mini Hackathon	Hackathon Team / TAs	Team challenge
13:30–13:40	Re-opening & Afternoon Framing	Host	Framing
13:40–13:55	From Summer School to Student HPC Community	MEng. Hoang Le Hai Thanh	Sharing
14:00–14:10	ACM Support for Students and HPC Schools	Prof. Fabrizio Gagliardi, BSC, ACM	Online talk
14:10–14:30	Top Team Presentations	Selected Student Teams	Presentation
14:30–14:45	International HPC Infrastructure Perspective	Dr. Chung Thanh Minh, LRZ	Online talk
15:00–15:25	Introduction to ACM Global Engagement Board	George Neville-Neil, ACM	Onsite talk
15:25–15:50	ACM Student Chapter and ASEAN HPC School Experience	Prof. Worawan Diaz Carballo, Thammasat University	Online talk
15:50–16:00	Remarks from Faculty of Computer Science and Engineering	Faculty Representative, CSE	Remarks
16:00–16:15	Awards, Certificates & Closing Remarks	Organizing Team / Faculty / HPCC	Awards + closing
16:15–16:30	Group Photo & Next Steps	Organizing Team	Photo

B Event Photos

Selected photos from the school, organized by program day.

B.1 Day 1 - HPC Foundations

(a) Opening ceremony with HPC Lab, Faculty of CSE, GreenNode.AI, and the organizing team.

(b) Assoc. Prof. Dr. Thoai Nam introduces the school theme and learning path.

Figure 1: Day 1 - opening ceremony and school briefing.

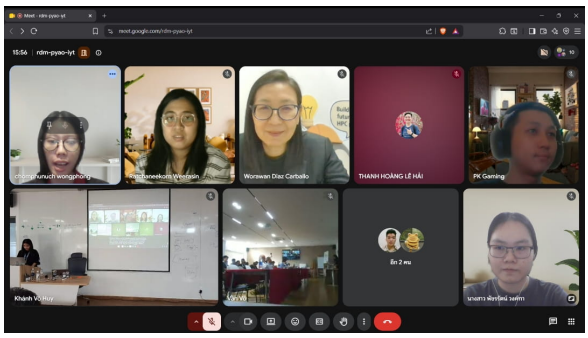
B.2 Day 2 - AI Workloads and Reproducibility

(a) Hands-on AI/HPC session with TA guidance on GPU resource requests.

(b) HPC Lab and Big Data Club research posters displayed outside the session room.

Figure 2: Day 2 - hands-on AI/HPC session and research showcase.

B.3 Day 3 - Mini Hackathon and Closing



(a) Invited speakers join the afternoon community program via Google Meet.

(b) Student teams work through the mini hackathon challenge.

(c) George Neville-Neil introduces ACM Global Engagement and student community pathways.

(d) GreenNode.AI partner attendance on Day 3.

(e) Closing group photo with participants, lecturers, TAs, and organizers.

Figure 3: Day 3 - mini hackathon, invited speakers, partner engagement, and closing.