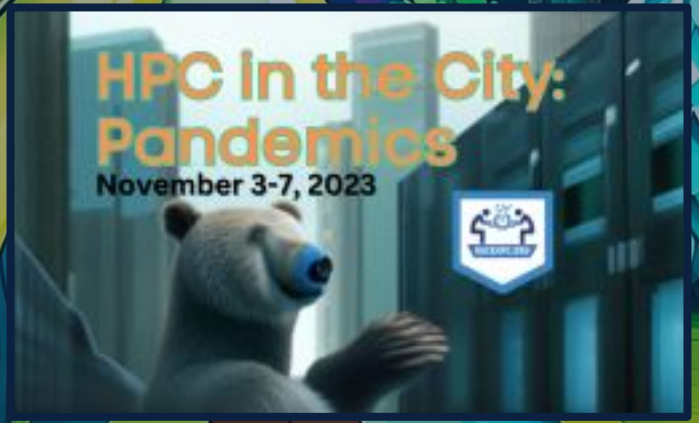
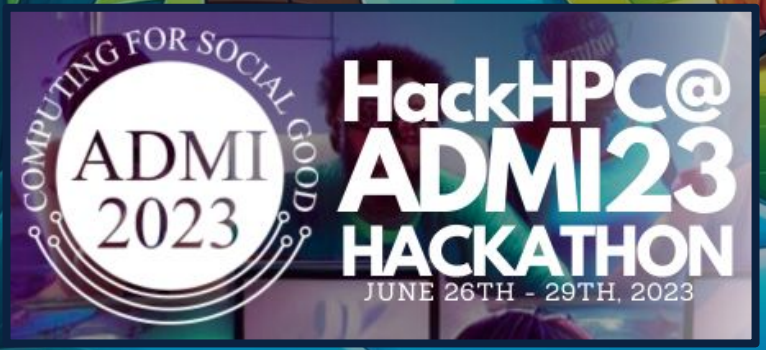
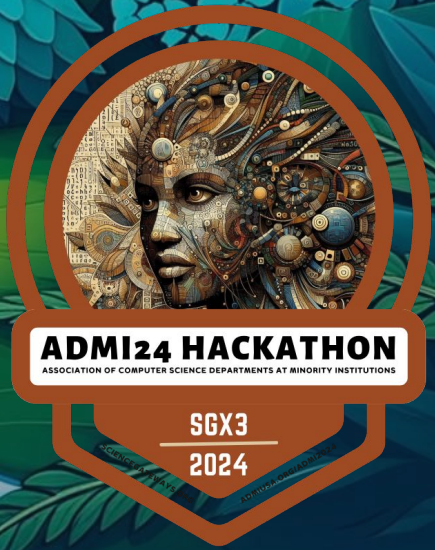

Spring 2025
Codeathon Training
Session 1: Kick-Off
SGX3
Extend. Expand. Exemplify.

Introductions



HackHPC
Hackathons and Codeathons





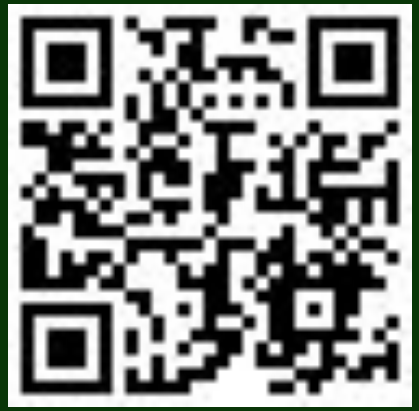
Deliverables

- Attend all virtual training events held Wednesday evenings 6pm – 8pm ET.
- Register for the 2025 ADMI Symposium (travel support provided)
- Complete the Bandit “War Games” units 25-33 on “UNIX command line scripting”.
- Submit an application to the Summer 2025 REU program for Purdue’s Anvil supercomputer. (*Closes Feb. 15th, 2025*)
- Create a GitHub repository with generated source code.
- Create and present a research poster of created project.

Links can be found on the SGX3 Codeathon Training 25 Event Site:
https://hackhpc.github.io/sgx3codeathontraining25/

Bandit “War Games”

URL: https://overthewire.org/wargames/bandit/

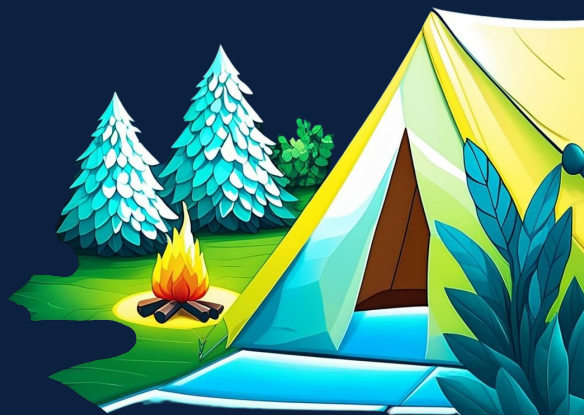


Training Goal

“To empower students with advanced coding skills, real-world problem-solving experience, and professional networking opportunities, fostering their growth as innovative tech leaders prepared to tackle complex challenges in high-performance computing and data science.”

Summarized Participant Motivations [Source: Event Application]

- Enhance coding skills and Linux proficiency
- Gain hands-on experience with HPC and data science
- Develop collaborative problem-solving abilities
- Network with peers and industry professionals
- Present research at ADMI 2025 Symposium
- Learn about science gateways and data accessibility
- Apply theoretical knowledge to real-world challenges
- Prepare for future careers in tech and research
- Explore diverse coding environments and tools
- Contribute to innovative projects with societal impact



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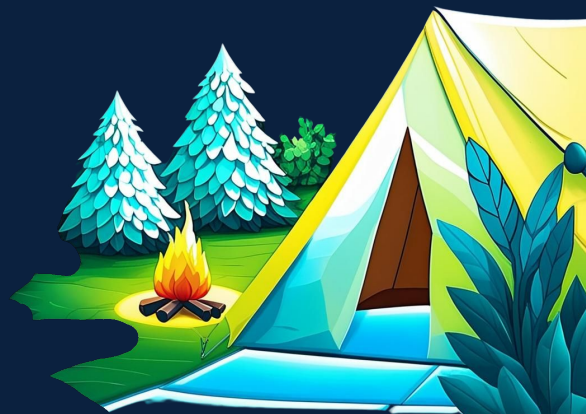
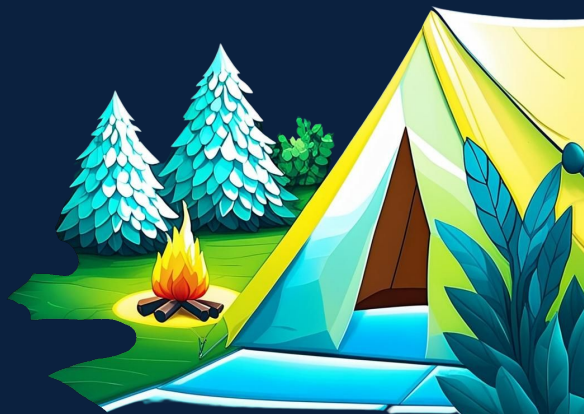
Research Interests

- **Interdisciplinary Applications:**
  Leveraging computer science, data science, and machine learning across fields like environmental science, healthcare, and gaming.
- **Environmental Focus:**
  Projects like flood detection and NASA research using remote sensing, big data, and predictive modeling.
- **AI and Machine Learning:**
  Exploring applications in education, healthcare diagnostics, and ethical AI development.
- **Innovative Technologies:**
  Interests in robotics (surgical systems, renewable energy) and carbon nanotubes for advanced solutions.
- **Creative Computing:**
  Adapting tabletop role-playing games into digital formats through interactive storytelling and narrative design.



Previous Experiences

- **Programming Languages:**
  Proficiency in Python, C++, HTML, with some experience in Go, JavaScript, R, and Java.
- **Data Analysis & Machine Learning:**
  Experience with data processing, visualization, predictive modeling, and using libraries like OpenCV, Pillow, TensorFlow, and Scikit-learn.
- **Research Skills:**
  Conducted projects in various fields including materials science, astronomy, environmental monitoring, and healthcare, with experience in scientific paper writing and collaboration.
- **Tools & Technologies:**
  Familiarity with Git, GitHub, Jupyter Notebook, Linux, and database management.
- **Specialized Areas:**
  Experience in cybersecurity, robotics, web development, and application of AI/ML in fields like healthcare and environmental science.



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AI Suggested Projects

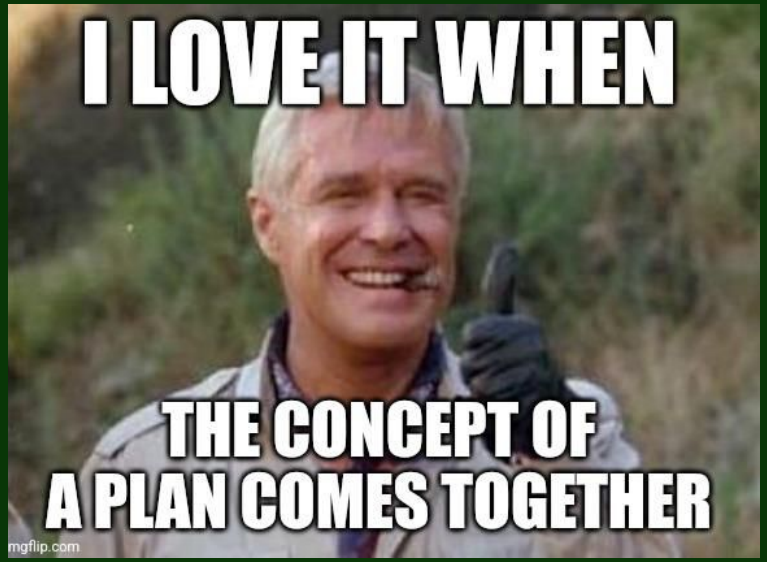
- **AI-Powered Science Gateway Assistant**
  Develop an intelligent chatbot that helps researchers navigate and utilize various science gateway tools and resources. This project would combine natural language processing and machine learning to create a user-friendly interface for accessing complex scientific applications.

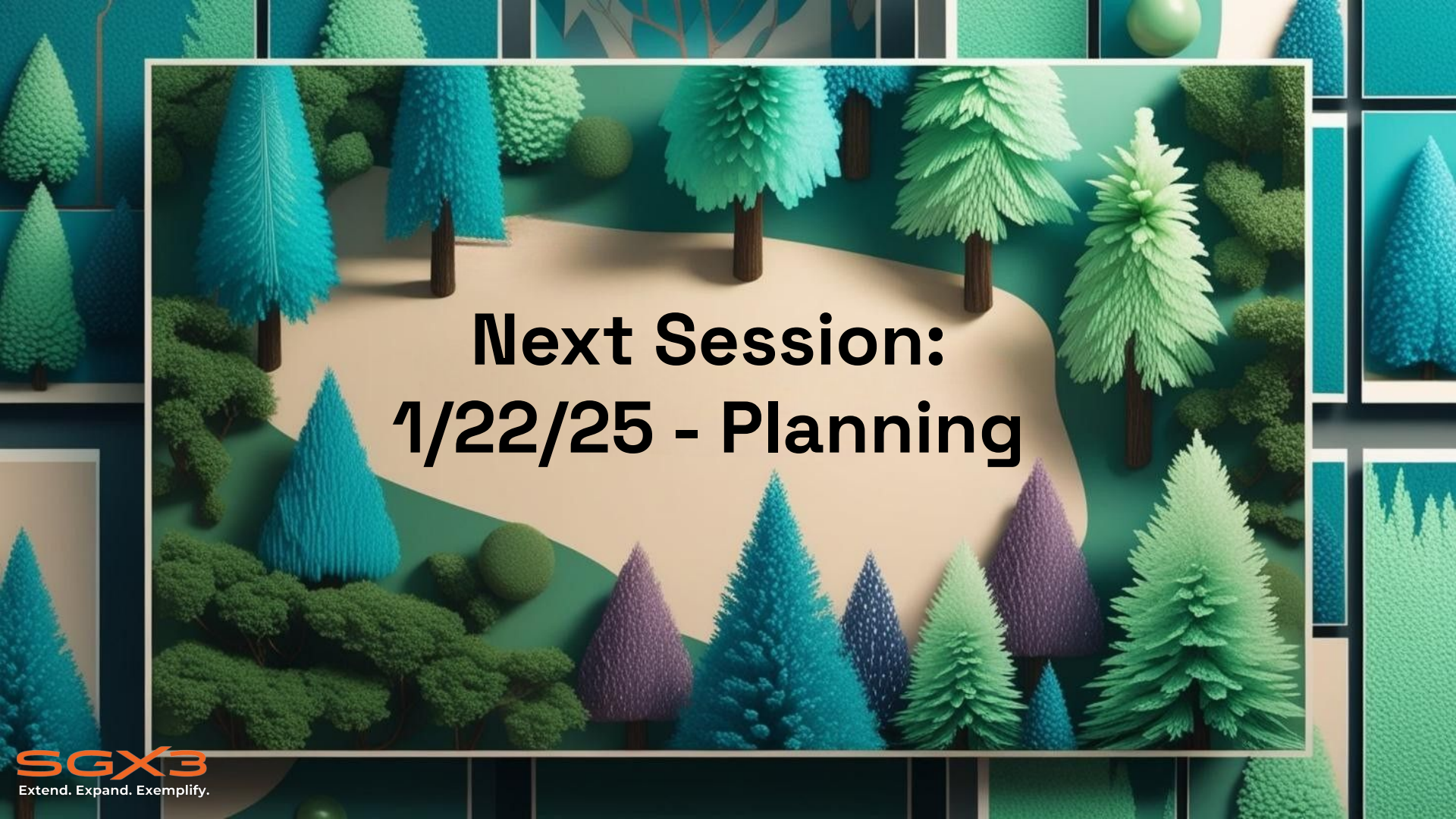
- **Collaborative Virtual Research Environment**
  Design a virtual space within a science gateway where researchers can collaborate in real-time, share data, and work on projects together. This would involve using web development skills, implementing real-time communication protocols, and integrating with existing gateway infrastructure**s.**

- **Science Gateway Mobile Companion App**
  Develop a mobile application that complements existing science gateway platforms, allowing researchers to monitor experiments, receive notifications, and access key features on-the-go. This project would utilize mobile app development skills and API integration.

Method

- Pick a project as a group
- Break the project into tasks
- Break the tasks into skill sets
- Set leads for the skills sets to direct the tasks
- Use AI as must as possible to do the coding for us





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