## ALL-HANDS MEETING'23

ICICLE project partners convened in central Columbus for the All Hands Meeting (AHM) on Nov 2-3, 2023. The overarching theme of the meeting was "To *Innovate, Integrate and Generalize on the Path to Global Scale*" with a focus to introduce new project proposals, identify areas of collaboration and strategize work for Year 3.

Dave Hudak, OSC Director along with NSF Directors Jim Donlon, Varun Chandola and Sharon Geva delivered opening remarks and participated in project discussions.

Twenty eight new proposals were reviewed and discussed over the course of two days to plan for end-to end CI integration in Year 3, generalize CI components to a broader scale, and bring in more stakeholder participation and commitment.

ICICLE NextGens and Educational Fellows had the valuable opportunity to present their research work and activity accomplishments. The showcase featured more than 15 poster/demo presentations.
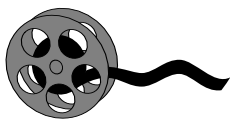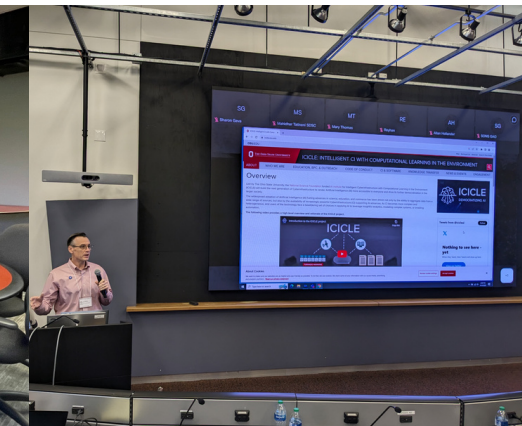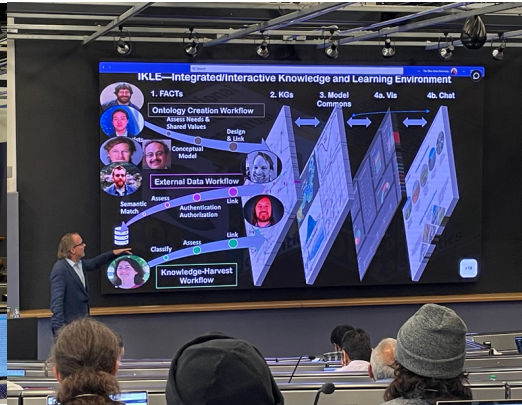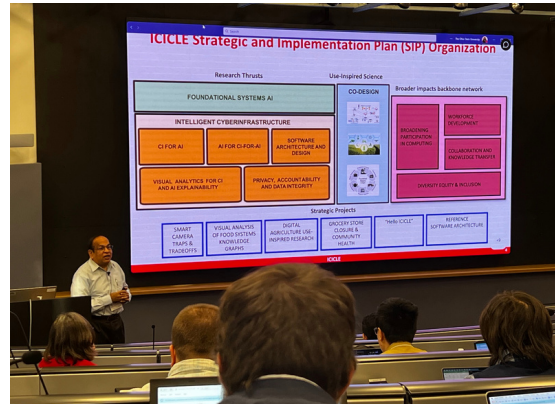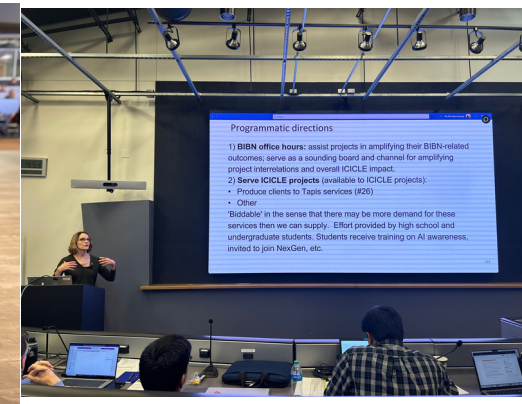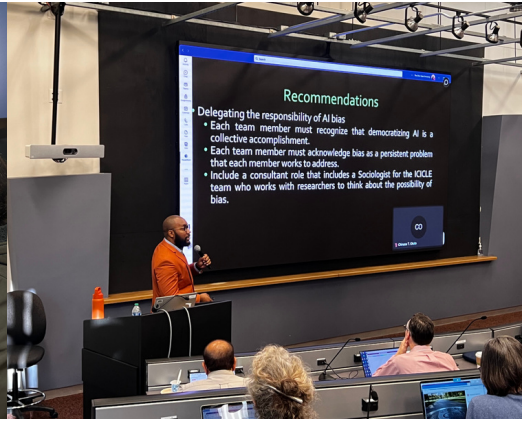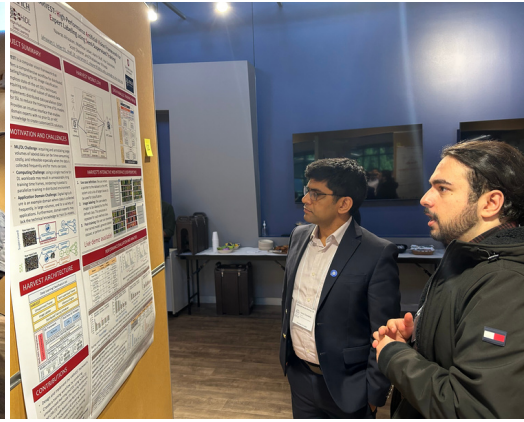
ICICLE WORKSHOP AT COLUMBUS SCHOOL FOR GIRLS AS PART OF CENTRAL OHIO'S ONE-DAY HACKATHON FOR HIGH SCHOOLERS (NOVEMBER 18-2023)

Amid Central Ohio's One-day Hackathon for High Schoolers, Dr. Hari Subramoni and Swathi Valabhajosyula visited Columbus School for Girls, acting as ambassadors for ICICLE. Together, they conducted an engaging workshop centered around the theme "Unlocking the Potential of Artificial Intelligence," featuring a demonstration of "AI-Powered Drones Applications in Action." Carlos Guzman added a touch of entertainment with his innovative application, which live-streams drone video while performing real-time detection of humans versus animals.

Dr. Hari guided the session by introducing the concept of "Artificial Intelligence" and delving into its pervasive presence in our surroundings. He facilitated an interactive discussion to define the fundamental goals of AI. He showcased how these objectives could be applied in social science contexts such as digital agriculture and animal ecology. Swathi shared anecdotes about the diverse student community within ICICLE, highlighting the collaborative efforts of students from K-12, undergraduates, and graduates in developing innovative technologies. The students actively participated in drone activities, capturing videos and observing the Megatron Detector in action as it distinguished humans from animals. Throughout this hands-on experience, they gained insights into dataset curation, DNN training, and the mechanics of live inference.

ICICLE
DEMOCRATIZING AI

AI INSTITUTE FOR INTELLIGENT CYBERINFRASTRUCTURE WITH COMPUTATIONAL LEARNING IN THE ENVIRONMENT (ICICLE)

Unlocking the Potential of Artificial Intelligence

AI is like a high-tech magician at a kid's birthday party, wowing everyone with tricks, but we're only scratching the surface of its true potential. The challenge? It's like building a rocket ship from scratch – you need fancy gadgets and more data.

But hey, there's hope! AI, with its party tricks like ChatGPT, makes you feel like a superstar in certain tasks, like turning gibberish into Shakespearean prose. Just remember, it's like a one-hit wonder; it shines in its spotlight, leaving other possibilities in the shadows. So, let's keep exploring the AI circus and see what other tricks it has up its sleeve!
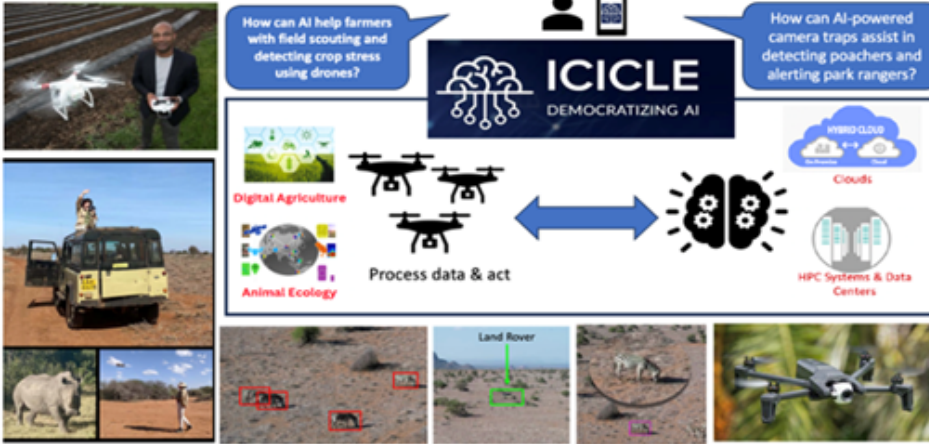
Write an essay on "Alien invasion"

Can you solve for "X"?

Tell me a "Fall" joke.

AI-Powered Drones in Action

How can AI help farmers with field scouting and detecting crop stress using drones?

How can AI-powered camera traps assist in detecting poachers and alerting park rangers?

ICICLE
DEMOCRATIZING AI

Digital Agriculture

Animal Ecology

Process data & act

HYBRID CLOUD

Clouds

HPC Systems & Data Centers

Land Rover

Join us for a live demo where we'll introduce you to AI-powered drones. These drones can collect data from plants and animals without disruption. They use smart data processing methods, including edge and edge-to-server processing, to answer questions like:
- "How can AI help farmers with field scouting and detecting crop stress using drones?"
- "How can AI-powered camera traps assist in detecting poachers and alerting park rangers?"

Central Ohio's One-day Hackathon For High Schoolers

when? 11:30 AM
18th November'23
Columbus School for Girls **WHERE?**

Witness the potential of AI and drones working together. Together, we'll explore how AI can benefit our society.

Don't miss this live demo – an opportunity to be part of the learning experience.

ICICLE AND ITS NEXTGENS AT
# SCIENCE GATEWAYS'23

The Science Gateways Community Institute (SGCI) plays a crucial role as a service organization dedicated to assisting individuals in creating and operating science gateways. In 2022, SGCI achieved a significant milestone by establishing SGX3, a Cyberinfrastructure Center of Excellence. As a part of SGCI, SGX3 aims to expand access, boost community involvement, and establish best practices in Cyberinfrastructure through science gateways generously funded by the NSF.

An ICICLE NextGen, Swathi Vallabhajosyula, was awarded by SGX3 to attend Gateways'23 and showcase her research along with the associated software components. She won the Best Student Poster - RUNNER UP for her research work.
Vallabhajosyula, M. S., Ramnath, R., & Stubbs, J. (2023). Custom Cost, Loss, And Reward Functions to Train Regression Models for Estimating Execution Resources using HARP. Science Gateways 2023 (SG23), Pittsburgh, PA. Zenodo https://doi.org/10.5281/zenodo.10055657

Stepping into this transformative initiative, Swathi Vallabhajousyula, a Ph.D. student associated with ICICLE and NextGen, took on the role of an SGX3-2023 Graduate Intern, guided by Dr. Joe Stubbs. During her tenure, Swathi focused on elevating the software engineering aspects of her HARP (HPC Application Runtime Predictor) research project. She specifically applied FAIR principles, addressed generalizability issues, and delved into innovative technologies to craft cyberinfrastructure-agnostic software components. Her work extended to developing interaction-interfacing APIs using Flask and MongoDB and containerizing various HARP components.
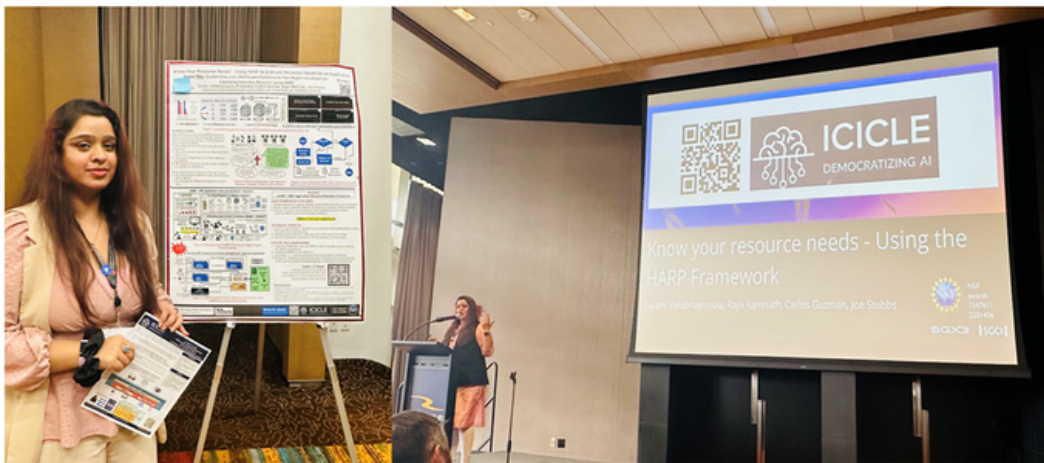
At Gateways'23, she highlighted her collaborative initiatives with ICICLE and SGX3 by presenting both a poster—awarded the best runner-up student award—and a portal. Moving beyond the presentations, she actively participated in NSF panel discussions and luncheons, acquiring valuable insights into research funding and cultivating professional connections. Moreover, she wholeheartedly embraced the mentor-mentee program, exchanging experiences and insights with esteemed professors and fellow researchers.

In tandem with Swathi's experiences, Christian Garcia delivered a noteworthy presentation on ICICLE's endeavors, titled "Exploring the Tapis Pods Service and Analyzing Its Initial Performance." This session illuminated the integration of ICICLE and TAPIS for user-driven workflows, exemplified by applications such as Smart Food Sheds and Animal Ecology-Camera Traps. The tutorial underscored the Tapis Pods service as an open-source API within the Tapis platform, streamlining Kubernetes container management, networking, and security at TACC. Offering a flexible container deployment solution, it showcased unique features and robust performance.

For more information on Science Gateways, explore:
https://sciencegateways.org/gateways2023-program

ICICLE NEXTGENS AT ALL-HANDS MEETING'23

During the Year 3 All-Hands Meeting in Columbus, Ohio, Swathi Vallabhajosyula led an engaging team-building event for ICICLE NextGens. The objective was to acquaint all NextGens with ICICLE resources and communication channels while immersing them in a collaborative team-building activity reflecting the partnerships within ICICLE. Dr. Rudi Eigenmann provided valuable insights into the impact on NextGens and underscored the significance of students in the ICICLE community.

"CAN YOU SUCCESSFULLY REACH THE OTHER SIDE OF THE BRIDGE?"

This intriguing question prompted the ICICLE NextGens to engage in a unique team-building activity—constructing a bridge using newspapers held together with tape. At first glance, it may seem simple. However, the challenge intensifies as the bridge connects one side of the city to the University on the opposite side of the river. The additional twist? The NextGens must navigate an iPhone across the bridge, and since swimming is not an option, the structure must support their weights until they reach the other side, all within a one-minute timeframe.

NextGens Team Building Activity @ All Hands'23

BUILD   SUPPLY   TEST   BUILD

Activity:
Built a Bridge using News Papers & Tape
Goal:
The bridge should hold an object for 30 seconds

The NextGens enthusiastically accepted the challenge, acquiring practical experience in allocating and managing resources, thorough testing at every stage of development, and fostering effective communication between teams responsible for constructing different components. Organized into four sections, two were assigned to build the bridge, one handled resource management, and another meticulously tested each step of the construction process. Their collective efforts successfully constructed a robust bridge that effectively supported all their phones without any signs of movement.

"The dynamic nature of the requirements posed a demanding yet challenging and thought-provoking task for the bridge."-The Development team.

"We often find ourselves overestimating the resource requirements. However, being accommodated with only half of the initially requested materials and supplying additional materials ad-hoc taught us the importance of planning. It shed light on how some things need not be complicated, and we can build on experience." - Resource Management team.
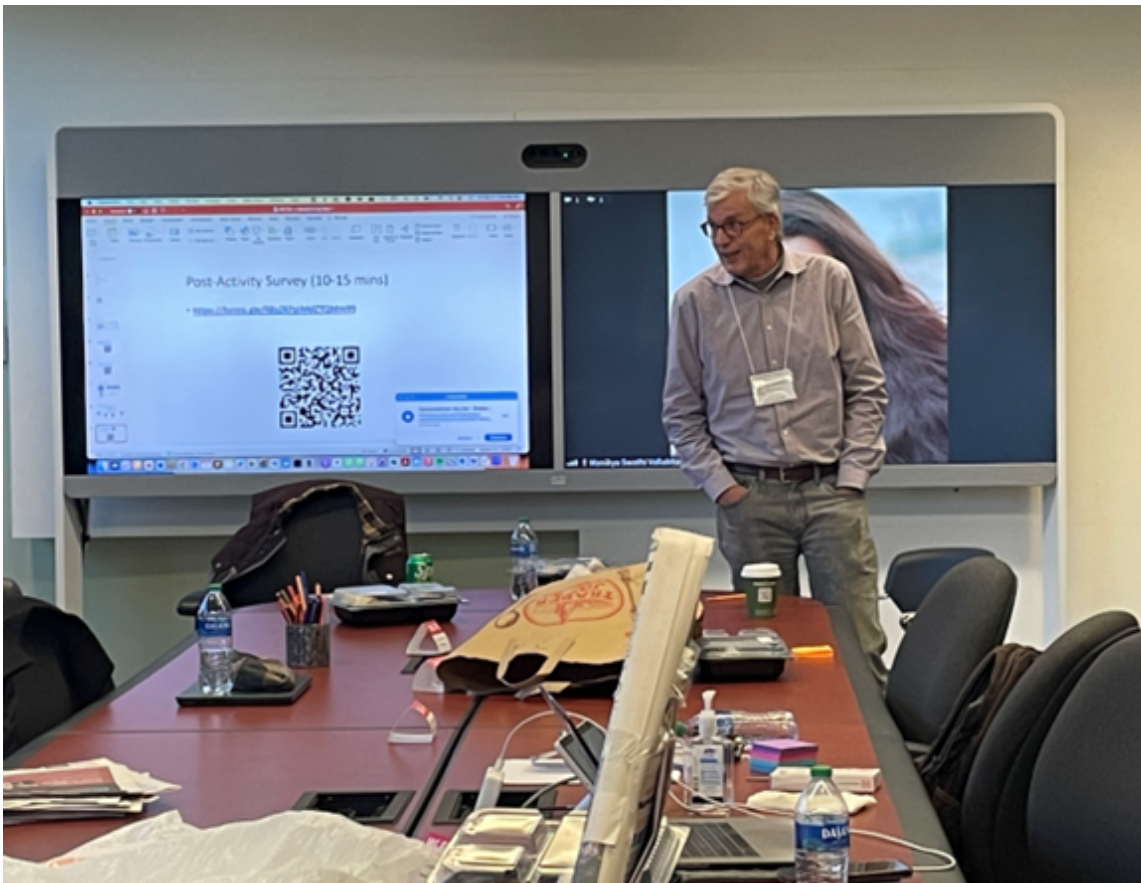
In his parting words, Dr. Rudi Eigenmann passionately emphasized the pivotal role of ICICLE NextGens, highlighting the essence of students as the nucleus of any academic institution. He encouraged them to leverage the established resources and connections to propel their career journeys forward. Driven by enthusiasm, he actively guided the NextGens through each step of constructing the "ICICLE Golden Bridge."

The NextGens seized the opportunity to showcase the ICICLE research modules through posters and shared their work and experiences with all ICICLE participants.

ICICLE SOFTWARE & CI METRICS

ICICLE Components	GitHub Total Clones	GitHub Unique Clones	GitHub Total Page Views	GitHub Unique Page Views	PyPI Total Downloads	Container Downloads
CI Components Catalog	275	141	1,461	83		
HARP + 4 containers	160	91	1,932	97		20
Hello ICICLE Auth Clients	14	14	98	12		
iciflaskn					663	
ICICONSOLE					13,703	
ICICLE Foodshed Parser						70
iSpLib	34	26	44	18		
PPOD CA	61	37	45	18		
PPOD LinkML	61	37	45	11		
Region2vec	15	10	29	8		
Smartfoodshed VA_VC1	381	121	3,122	92		
SoftwarePilot					24,721	
Species- Classification- Multimodal-Context	26	20	91	14		
Store Closure						106
TapisCL-ICICLE					26,968	

The ICICLE team aims to build the next generation Cyberinfrastructure (CI) to render Artificial Intelligence (AI) more accessible to everyone and to drive its democratization further in solving larger societal problems.

Release notes for ICICLE Software and CI components
are available here

We welcome your feedback and suggestions for future releases.
https://lists.osu.edu/mailman/listinfo/icicle-discuss
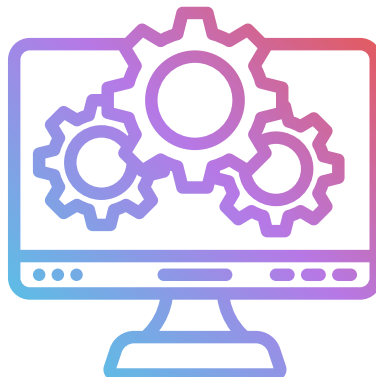
ICICLE TIPS ON AI ETHICS

A series of short videos that situates AI Ethics in an accessible, tip-oriented manner. The series is motivated by the belief that *forethought about ethical implications can create better outcomes*. Check out the tips listed below -

- **TIP #1**: REMEMBER THAT AI IS NOT INEVITABLE.
- **TIP #2**: RECOGNIZE THAT OUR RESPONSIBILITY IS TO THE POSITIVE OUTCOMES WE WORK TOWARDS
- **TIP #3**: DIMENSIONS OF PRIVACY
- **TIP #4**: FAIRNESS – FOCUS ON STAKEHOLDERS AND USE-INSPIRED SCIENCE
- **TIP #5**: TRUSTWORTHINESS – WHAT DOES IT TAKE TO TRUST AI AND CYBERINFRASTRUCTURE ?
- **TIP #6**: ACCOUNTABILITY – PROVIDES MECHANISMS FOR EVALUATING TRUSTWORTHINESS
- **TIP #7**: AI DEMOCRATIZATION IN ICICLE

Browse all Tips for AI Ethics here

ICICLE TIPS ON ALLYSHIP

The Broader Impact Backbone Network team has created tips in video format on how we, here at ICICLE, can become better allies

TO PROMOTE AN AWARE , INCLUSIVE , AND MORE DIVERSE COMMUNITY

Browse all Tips for Allyship here

RECENT PRESENTATIONS & PUBLICATIONS

- Guoying Zu, Md Nadim, Salil Reddy, Taimoor Ul Islam, Sarath Babu, Tianyi Zhang, Daji Qiao, Hongwei Zhang, Anish Arora, AraHaul: Multi-Modal Wireless X-Haul Living Lab for Long-Distance, High-Capacity Communications, IEEE Future Networks World Forum (FNWF), November 2023
- Khan, S., Morales, A., Plale, B, "Democratization is a Process, Not a Destination: Operationalizing Ethics and Democratization in a Cyberinfrastructure for AI Project", Proceedings of the EAI 2nd International Conference on AI for People, Democratizing AI, November 2023
- Qiyang Ding, Pengfei Zheng, Shreyas Kudari, Shivaram Venkataraman, Zhao Zhang "Mirage: Towards Low-interruption Services on Batch GPU Clusters with Reinforcement Learning", November 2023

Click here to view all ICICLE Presentations and Publications

SUBSCRIBE TO ICICLE MAILING LISTS

The following mailing lists are available for ICICLE software and cyberinfrasturucture releases, future updates and miscellaneous questions regarding installation/build problems, performance issues.

- **icicle-announce**: This is an announcement list only. If you would like to get information about future updates, software and cyberinfrastructure releases, publications, etc. related to the ICICLE project, you may subscribe to this mailing list. This list is open to public. You are welcome to subscribe to this mailing list yourself.
- **icicle-discuss**: This is a discussion list. This mailing list is meant for users to discuss all installation/build problems, performance issues, features and other miscellaneous questions related to the different software and cyberinfrasturucture components of the ICICLE project. In order to post your questions and suggestions to this mailing list, you need to be a registered user of ICICLE with an organizational e-mail address and be a member of this list by subscribing to it with the same e-mail address. If you are not a registered user, please follow the procedure indicated under Download tab in the top menu to get registered.

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