

CISE Community Research Infrastructure (CCRI)

- CCRI Leadership Team
 - Harriet Taylor, CNS
 - Mimi McClure, CNS
 - Yuanyuan Yang, CCF
 - Tanya Korelsky, IIS
- A group of CISE program officers across all three core divisions manage panels and oversee awards

CCRI evolved from CRI

- CISE Research Infrastructure (CRI)
 - 2004 – 2018
 - Funded Institutional (II) and Community infrastructure (CI)
 - Was created to fund unique and emerging CISE infrastructure needs of CISE researchers
- Flat budget from 2008 – 2018 (\$18M)
- During CRI, demand for simple institutional infrastructure increased
 - FY 2016 – 235 CRI preliminary proposals
 - 174 (75%) were II requests, more than half requesting departmental upgrades, clusters, and private clouds
- Hard to balance II versus CI funding and make a critical impact in either

Some significant CRI community infrastructures



Software-artifact Infrastructure Repository



PLANETLAB

An open platform for developing, deploying, and accessing planetary-scale services



CCRI rationale

- Focus exclusively on *community* infrastructure – use resources to do the most good
- Fund larger awards to provide and maintain *significant* infrastructures
- Provide an environment for community outreach and developing a significant broad and diverse user communities
- Establish a CCRI-CVO – Community Virtual organization
- Enable research not possible with currently available community resources
- Target researchers pursuing a focused, CISE-centric research agenda using resources developed and led by CISE researchers
- Develop and nurture research communities that will move the frontiers of CISE research forward

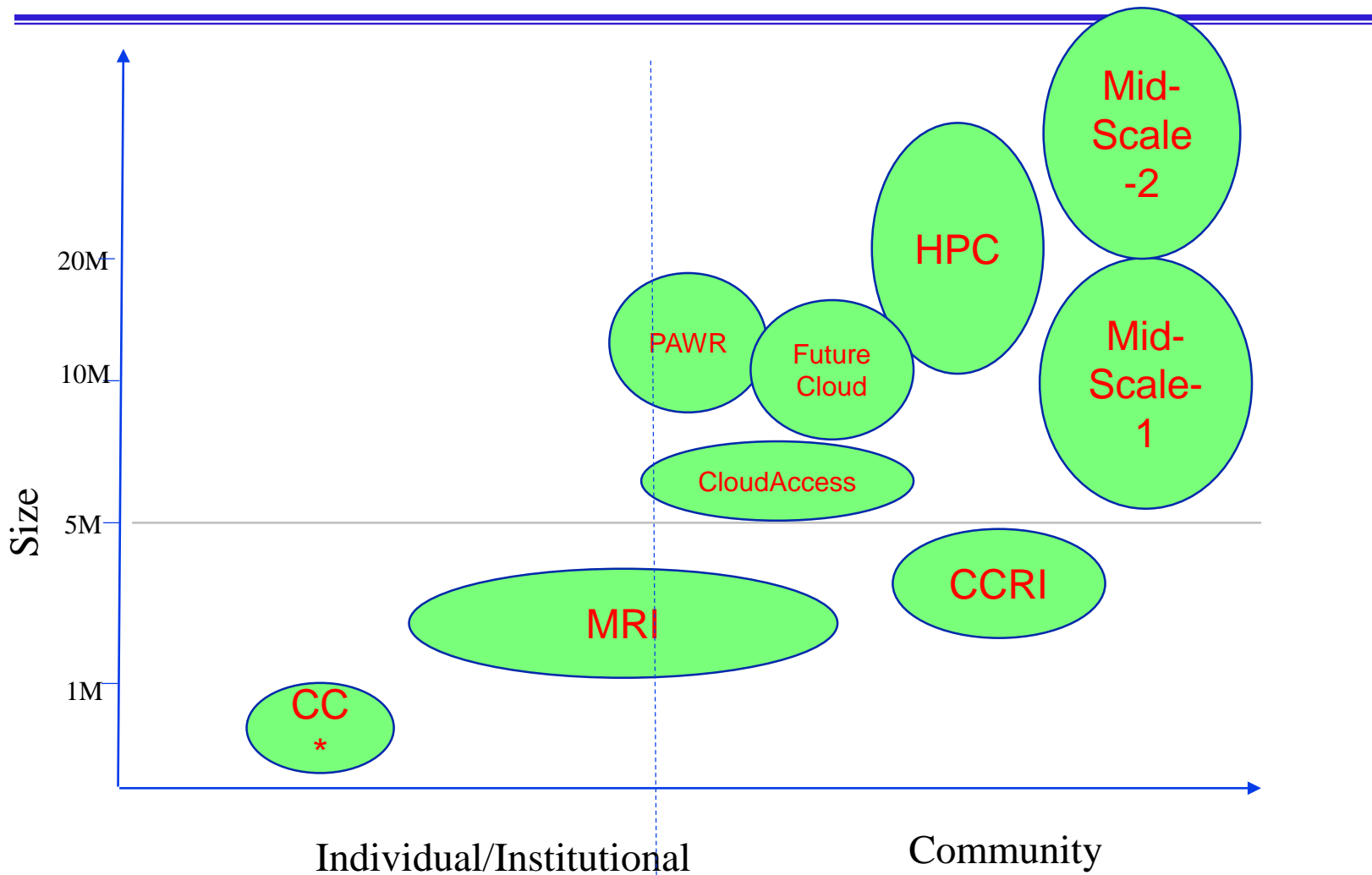
CCRI began in 2019. It is in its second competition this year.

Overview of CCRI program

- Enable the creation and enhancement of world-class research infrastructure
 - Integrated suites of tools, resources, and user services, and community outreach
- Develop CISE-centric research infrastructure that will support diverse communities of CISE researchers pursuing focused, CISE-centric research agendas
- Provide research infrastructure that will help CISE researchers explore and extend CISE research frontiers

The three CISE core divisions (CCF, CNS, IIS) participate in CCRI.

CISE Infrastructure Programs



CCRI Portfolio

- 4 types of CCRI projects
 - New – Planning (up to \$100K)
 - New – Medium (up to \$1.5M)
 - New – Grand (up to \$5M for 5 years)
 - Enhance/Sustain (up to \$2M)
- Grand and Enhance/Sustain must have designated Community Outreach Director and dedicate about 20% of their funds for research community outreach
- All CCRI projects must participate in CCRI CVO
 - Effort to get more info about available resources out to all CISE researchers
 - Have PIs identify best practices and ways to sustain infrastructures
 - Participation in CVO is voluntary for CRI awardees

CCRI funded projects

Projects span all CISE core areas

- Physical robotic manipulation test facility
- Next-generation parallel-programming research
- Advances in network topology analysis
- Safe, secure, and coordinated autonomy of UAVs
- Cybersecurity community hub
- Big Data management system
- Ecosystem to support spoken dialog systems research
- Expand the reach of computer architecture simulation
- Repository of datasets to support machine learning research

2019 CCRI award data

CCRI funds - \$24M

Co-funding - \$3M

23 projects funded covering 28 awards

- Planning – 8 awards (up to \$100K)
- New/Medium – 6 awards (up to \$1.5M)
- Enhance/Sustain – 6 awards (up to \$2M)
- Grand – 2 awards (up to \$5M)
- CCRI-CVO – 1 award (\$635K, 3 years)

- Awards cover 14 states, range of institutions
- Grand awards funded as continuing awards with required site visit in 3rd year
- Larger resources require a significant research team with credibility within target CISE research community
- Award to RTI for to develop and manage CCRI-CVO

CCRI Highlights – Grand awards

CNS 1952601 – Colosseum: Opening and Expanding the World's Largest Network Emulator to the Wireless Network Community

Tommaso Melodia (Northeastern University)

- Transitions DARPA Colosseum radio channel emulator to a new environment and opens it to a wider research community
- Integrates resource with two PAWR sites
- Capitalizes on a unique opportunity to enhance and preserve a valuable resource as it leaves DARPA

CCRI Grand award

CNS 1925464/1925658/1925504 Developing a Testbed for the Research Community Exploring Next-Generation Cloud Platforms

Michael Zink (Mass Amherst), Peter Desnoyers (Northeastern), Orran Krieger (Boston U)

- Establishes Open CloudLab(OCL)
- Extends existing NSF-funded CloudLab with resources from Mass Open Cloud and Mass Green High-Performance Computing Center and others
- Adds test-bed resources and datasets that will catalyze large-scale CISE systems research

Recap

- CCRI is an ongoing experiment to re-imagine the way CISE can provide research infrastructure
- CCRI is evolving
- CCRI funding needs will climb in future years due to the out-year funding of Grand awards and rising costs
- CCRI uniquely provides infrastructure to meet CISE research needs and build community
- Sustainability is a major issue

Special message

- The first CCRI-CVO PI meeting will be on June 4-5 of this year. The meeting will be held in Crystal City.
- We want to stress this opportunity for CISE researchers to work together to propose significant infrastructure that can benefit their whole community and to assume community ownership and leadership of the resources.

Questions