

Geospatial Fellows for Advancing COVID-19 Research & Education

<https://gsi.cigi.illinois.edu/geospatial-fellows-members/>

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NSF SI2-S2I2 Conceptualization: Geospatial Software Institute (GSI)

- Conceptualize a Geospatial Software Institute (GSI) as a long-term hub of excellence to serve diverse research and education communities
- <http://bit.ly/GSIstrategicPlanDraft>
- Twitter hashtag
 - #GSIfuture

Steering Committee



Donna Cox

National Center for Supercomputing
Applications/University of Illinois

Co-PI



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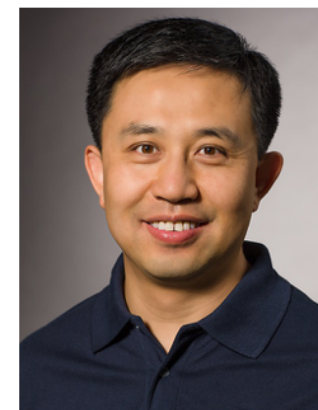
Co-PI



Anand Padmanabhan

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Chair, PI

Partnerships

- Academic & International
 - AAG
 - AGILE
 - AGU
 - CyberGIS
 - ESIP
 - GIScience
 - UCGIS
 - Etc.
- Government
 - CDC
 - DOE
 - EPA
 - NASA
 - NGA
 - NIH
 - USGS
 - Etc.
- Industry
 - DigitalGlobe
 - Esri
 - Google
 - HDF
 - Kitware
 - LimnoTech
 - OGC
 - Etc.

Representatives of Partners



Jerad Bales

Consortium of Universities for the Advancement
of Hydrologic Science, Inc. (CUAHSI)



Coline C. Dony

American Association of Geographers (AAG)



Ned English

NORC, University of Chicago



George Percivall

Open Geospatial Consortium (OGC)



Diana S. Sinton

University Consortium for Geographic
Information Science (UCGIS)

Mission

- Transform geospatial software, cyberinfrastructure (CI), and data science across many fields to revolutionize diverse discovery and innovation by enhancing computational transparency and reproducibility

Vision

- A sustainable social and technical ecosystem to enable geospatial-inspired innovation and discovery

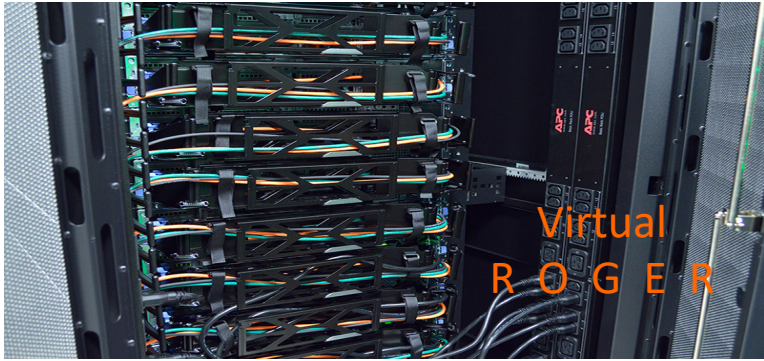
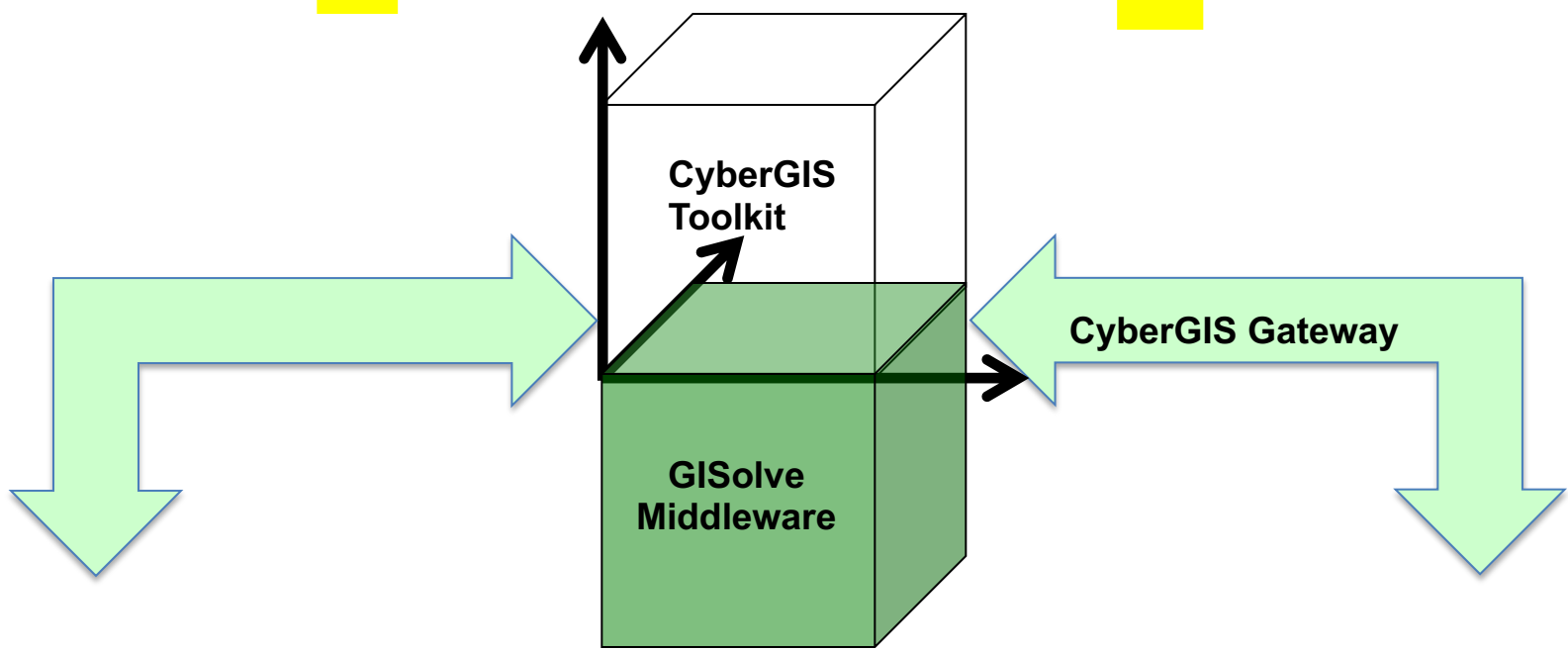
Goals

- Reproducible, transparent, and scalable geospatial software: Enable researchers to harness the geospatial data revolution for discovery and innovation by combining geospatial software and data at scale, in reproducible and transparent ways
- Geospatial digital workforce: Increase the nation's workforce capability and capacity to utilize geospatial big data and software for knowledge discovery supported by critical spatial thinking, and to further innovate geospatial software and advance related sciences
- Ethical and open geospatial software: Promote a culture of ethical and open geospatial software driven by diverse communities
- Structured guidance for computational reproducibility: Establish structured guidance for computational reproducibility in scientific research and education that are dependent on geospatial software
- High-performance and data-intensive geospatial software: Further the convergence of high-performance geospatial software with advancements in data-intensive and high-performance computing

The context of GSI's mission, vision, and goals



Geospatial Discovery and Innovation

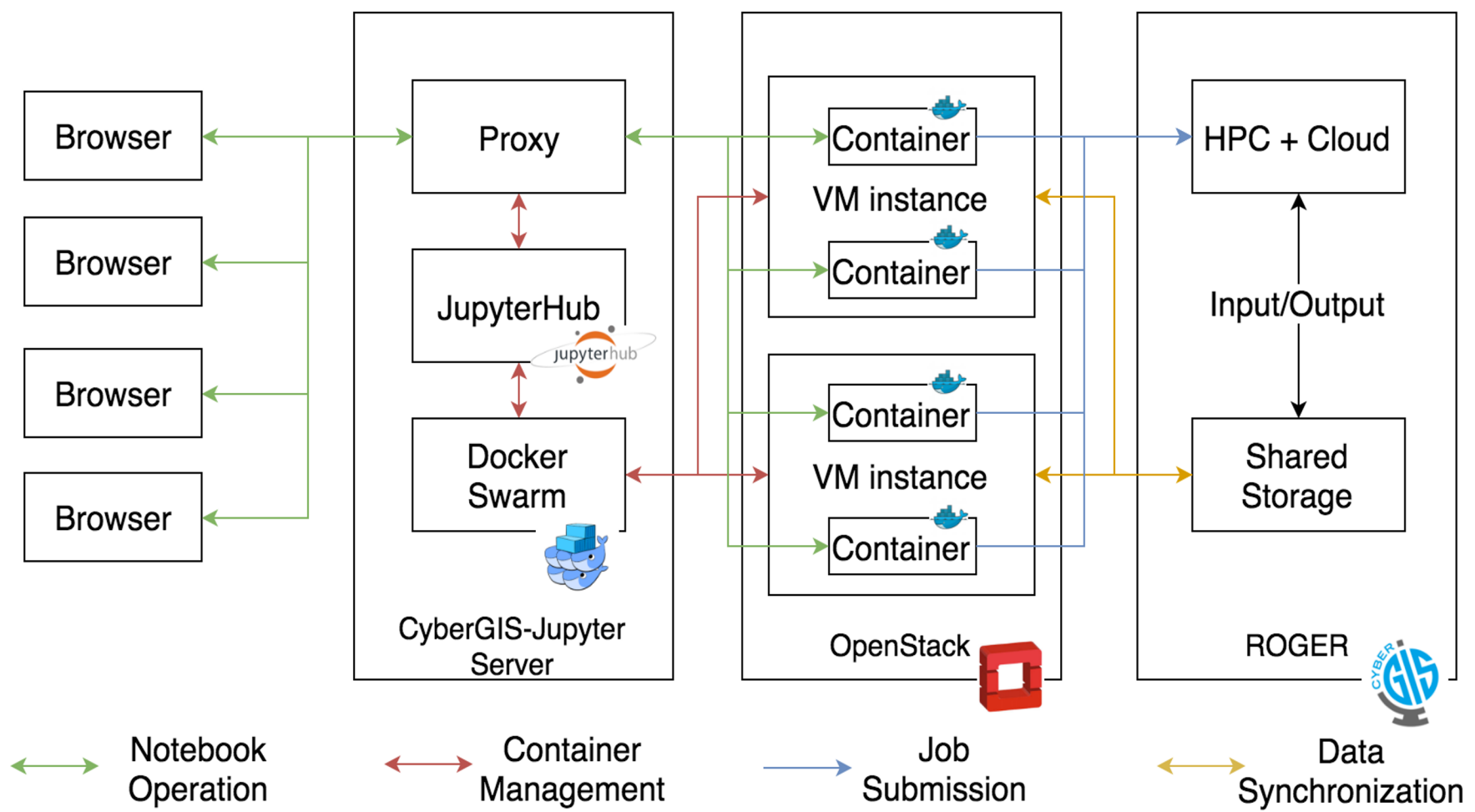


<http://cybergis.illinois.edu>



www.xsede.org

CyberGIS-Jupyter



Geospatial Hub for Convergent COVID-19 Research and Education

DEMO

CyberGISX | Geospatial Comm x +

cybergisxhub.cigi.illinois.edu

CyberGISX

About Get Started Community Notebooks Contact Register Log In I

CyberGISX ^(alpha)

Providing streamlined cyberinfrastructure access and an integrated software stack for computationally reproducible research and education across a variety of geospatial-related domains.

WhereCOVID-19 Notebooks

WhereCOVID-19 notebooks map multi-scale spread of COVID-19 and assess related impacts by integrating diverse geospatial data, analysis, and modeling capabilities based on CyberGIS-Jupyter, an innovative cyberGIS framework for conducting data-intensive, reproducible, and scalable geospatial analytics using Jupyter Notebooks as the primary user environment.

Get Started with CyberGISX

CyberGISX notebooks include geospatial codes, workflows with comments, and visualizations providing a solid foundation for conducting computationally reproducible research and education.

See Community Notebooks

Key Deliverables of Geospatial Fellows

- A set of CyberGIS-Jupyter notebooks developed and contributed by a group of Geospatial Fellows for conducting cutting-edge COVID-19 research and education enabled by advanced cyberinfrastructure and geospatial software
- A COVID-19 Geospatial Hub for easy organization and sharing of these notebooks as computationally reproducible and scalable geospatial analysis and modeling software modules to foster collaborative research and education for fighting COVID-19
- A white paper addressing the roadmap of geospatial software for advancing COVID-19 research and education by organizing a series of online community activities to bring together experts of both cyberinfrastructure and domain sciences

Overarching

- Peter Kedron and Joseph Holler. Working with Students to Reproduce COVID-19 Research to Establish the Credibility of Findings and Accelerate Policymaker Adoption

Methods: Analysis, Modeling and Simulation

- Clio Andris. Spatial Social Network (SSN) Contact Tracing Software Development and Application to the Fire Department of New York City
- Xiang Chen. Compliance and Containment: Meso-scale Modeling and Monitoring of COVID-19
- Song Gao. Geospatial Modeling of COVID-19 Spread Using Human Mobility Big Data and Deep Learning
- Daniel Goldberg. COVID-19 Spatial Accessibility
- Kenan Li and John Wilson. Modeling the Human Mobility Impacts on the Spread of the Covid-19 Pandemic
- Xun Shi. A Bottom-up Approach to Epidemic Modeling

Impacts

- Andrew Greenlee. An Analytical Framework for Post-Eviction Residential Location Outcomes in New York City: Implications for COVID Recovery
- Naomi Lazarus. Examining the Causal Effects of Age and Underlying Conditions on COVID-19 Incidence and Mortality
- Ruby Mendenhall. Youth Citizen (Community) Scientists Mapping the Social, Economic and Environmental Impacts
- Ningchuan Xiao. Human Mobility: Understanding the Impact of COVID-19 and Its Social and Economic Contexts in Columbus, OH Using Traffic Camera Feeds

Social Dimension

- Daniel Block. Applications of CyberGIS in two Food Mapping Projects in Chicago and Suburban Cook County, Illinois
- Jayajit Chakraborty. Spatial and Social Disparities in Exposure to COVID-19 for People with Disabilities
- Daoqin Tong. A Transmutation of Food Access During the COVID-19 Pandemic and After

Technical Workshops

- October 6
 - Introduction to CyberGISX
 - Overview of WhereCOVID-19
 - Introduction to a Fellow's Project
- October 13
 - Ethical Geospatial Data Use
 - Working with CyberGISX Libraries
 - Working with CyberGISX Data
- October 20
 - Introduction to a Fellow's Project
 - Data Visualization on CyberGISX
 - High-Performance Computing with CyberGISX

Fellowship Activities

- Biweekly meetings
 - Share progress
 - Identify software and data needs
 - Provide feedback on CyberGISX and Geospatial Hub
- Monthly community webinars led by Fellows starting in November
- Blogs on Geospatial Hub

Resources

- CyberGISX platform
 - For developing and sharing CyberGIS-Jupyter notebooks
- Data resources shared on the platform
- Geospatial Hub based on CyberGISX
 - For hosting and sharing research and education materials
- Cyberinfrastructure resources
 - JetStream, Bridges GPU on NSF XSEDE
 - Virtual ROGER
- Technical consultation provided by CyberGIS Center



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 - OAC-1664119
 - OAC-1551492
 - OAC-1047916
 - XSEDE
- **AAG**
- **CUAHSI**
- **NORC, University of Chicago**
- **OGC**
- **UCGIS**

Thanks !

- **Comments / Questions?**
- **Emails**
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