Research Computing at UC Merced

OIT Behind the Scenes

Webinar Series
Setting Expectations

Lights!
- Camera & Audio

Cut!
- Q & A

Camera!
- Recorded Session

Action!
- Feedback requested
General overview of research computing & why it’s critical at UC Merced

High Performance Computing (HPC) resources on & off campus

How to get research computing help at any level
What is High Performance Computing (HPC)?
Cyberinfrastructure & Research Technologies
Sarvani Chadalapaka
Director, Cyberinfrastructure & Research Technologies (CIRT)
Why is HPC important?

How does CIRT figure in?
Why is HPC important?

• HPC speeds up academic research.

• Research production is critical to the UC Merced mission & obtaining R1 status.
How does CIRT figure in?

- Build HPC infrastructure
- Maintain environment
- Grow capabilities
CIRT RESOURCES AT UC MERCED

High Performance Computing
• MERCED cluster
• Pinnacles cluster

Wide Area Visualization Environment (WAVE)

High Speed Research Network (ScienceDMZ)
HPC at UC Merced

MERCED cluster
- NSF MRI Grant Number: 1429783
- NSF Award Amount: $515,842.00

Pinnacles cluster
- NSF MRI Grant Number: 2019144
- NSF Award Amount: $700,000

- 3000 cores each
  (750 times the power of a typical laptop)
- Infiniband network
- Scheduling software to allocate resources
Wide Area Visualization Environment (WAVE)
WAVE: Technical Specifications

- 20 OLED UHD 4K TVs
- 32 1080 graphics cards
- High-speed data transfer nodes
  - Connection to California Research and Education Network (CalREN) High Performance Research Network (HPR)
ScienceDMZ
CIRT MISSION
SEAMLESS TRANSITION BETWEEN COMPUTING LEVELS
HPC Training and Outreach

Yue Yu
Senior Research Computing Facilitator
Trending Computing Research

- Artificial intelligence (AI), machine learning, and robotics
- Big data analytics
- Computer-assisted education
- Bioinformatics
- Cyber security
Campus Demand

- Surge in demand in computational research on campus
  - Increasing account request
  - More active consultations
MERCED Cluster

- Head + 1 login node
- 110 CPU compute nodes
- 8GPU nodes
- Cluster storages + 0.5PB Borg storage
Pinnacles Cluster

- Head + 2 login nodes
- 40 CPU compute nodes
- 4 big memory CPU nodes
- 8 GPU nodes
Research Computing
HPC Demo
Support for New Users

- Research group consultation
- HPC intro class
- Workshops
Support for Experienced Users

ServiceHub → open a ticket for technical help

HPC office hours on Zoom
(Fridays 10:30am-12:00pm)

User documentation
Contact Me

Yue Yu
Senior Research Computing Facilitator

yyu49@ucmerced.edu
https://ucm.edu/ResearchComputingHelp
fastest way to get help

Or search Research Computing at https://servicehub.ucmerced.edu
Data Management & Software Carpentry

Derek Devnich
Director, UC Merced Center for Data Services
Data Management

- Study published
- Minor details lost/forgotten
- Important metadata lost/forgotten
- Career change, email breaks
- Accidental data loss
- Death of researcher
Good Scholarship is Reproducible
Data (and code) sharing is increasingly required by funders

More about funder requirements: http://datasharing.sparcopen.org/data
Workshops

- Data management: From plan to publication
- Creating data management plans with DMPTool
- Data management for social scientists and humanists
- How to choose a license
Come talk to us!
https://ucm.edu/DataServicesAppt

Create a data management plan!
https://dmptool.org

Come to our workshops!
https://libcal.ucmerced.edu/calendar/data_management

Read our informative documentation!
https://library.ucmerced.edu/research-data-curation
Software Carpentry

• Making software is a craft
  • You work with your hands
  • You respond to the needs & constraints of the moment
  • You get better with practice
The Ideal of Data Science

Import → Tidy → Transform → Visualize → Model → Communicate → Program
The Reality of Data Science

My Python environment has become so degraded that my laptop has been declared a Superfund site.
• Introduction to Unix shell
• Version control with Git and Github
• Programming and plotting in Python
• R for reproducible scientific analysis
Occasional Workshops

- Introduction to R for geospatial data
- Databases and SQL
- How to manage software development projects
Custom Workshops

- Custom workshops for research groups and graduate classes
- Instructor consultations
- Instructor training
Contact Me

Derek Devnich
Director, UC Merced Center for Data Services

ddevnich@ucmerced.edu
https://ucm.edu/DataServicesAppt

The fastest way to get help
CIRT Services

Sarvani Chadalapaka
Director, Cyberinfrastructure & Research Technologies (CIRT)
CIRT Services

• Colocation services
• On premises storage
• Condo-model compute node purchases for Pinnacles

CIRT Recharge Services (On Hold)

• MERCED cluster core-hour cycles
• Enhanced user support for research computing
Contact Me

Sarvani Chadalapaka
Director,
Cyberinfrastructure & Research Technologies

schadalapaka@ucmerced.edu
https://ucm.edu/ResearchComputingHelp
fastest way to get help
We Want Your Feedback!

Feedback Survey for today’s webinar:

https://ucm.edu/ResearchWebinar

Thanks in advance for helping us improve our future offerings to campus!
Q&A
COMING SOON: MORE BEHIND THE SCENES!

Apr 14th - Technology Procurement

April 27: IS-3 Ask Me Anything

Summer: Microsoft 365 Tools
OIT Behind the Scenes: Research Computing was created on location at the University of California, Merced in Merced, California!

Thanks to all the OIT (and non-OIT) folks who put hard work into this webinar!
Katie Adams Arca, Webinar Coordinator
*tries to rein in the madness*

Sarvani Chadalapaka, Subject Matter Expert
*graciously let us mess with already-good presentation materials*

Derek Devnich, Subject Matter Expert
*has the best slide illustrations*

Edson Gonzales, Webinar Support
*had it pretty easy on this one honestly*

Preethi Merugumala, Student Technology Consultant
*organizes the madness when we let her*

Christian Ortiz, Student Technology Consultant
*produced that animated explainer in no time at all*

Rachel Peters, Webinar Support
*know-it-all in charge*
Christy Snyder, Communications & Promotional Support
*can’t stop won’t stop messing with the deck*

Yue Yu, Subject Matter Expert
*makes cluster jobs look easy*

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surang
That’s all, folks!