Training

Overview

Workshops and Schedule | External Resources Training | Self Guided Training | Data Center Video Tour

HPC Workshops

Every semester, we offer a variety of workshops including, but not limited to, Intro to HPC, Intro to Machine Learning, Intro to Parallel Computing, Intro to Containers, and Data Management Workshops. Check the Workshops and Schedule section below to see the dates of our upcoming sessions or check out the links on the right-hand side for detailed information. We announce upcoming workshops through the hpc-announce listserv so if you do not see any workshops scheduled, keep your eye on your inbox. You may also want to look through our detailed pages for course slides, video presentations, and interactive guides.

External Training Resources

Other organizations provide great training opportunities. Check out this list for upcoming events.

Self Guided Training

Need some help getting started with Linux, GPU programming, Singularity, OpenMP, or Matlab? Check out the Self Guided Training section below for resources to get you up and running.

Data Center Video Tour

Have you ever wanted to see our supercomputers? Check out this guided tour through our data center!

Workshops and Schedule

These workshops are all introductory by nature. If you want more advanced workshops, the Data Science Institute conducts a broad range that can be found on their calendar.
Intro to HPC

Introduction to HPC

Click here for more detailed information

Upcoming Workshops

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Machine Learning on HPC

Machine Learning on HPC

Click here for more detailed information

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Intro to Parallel Computing
Introduction to Parallel Computing

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Intro to Containers

Introduction to Containers on HPC

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Data Management Workshops
## Data Management Workshops

Click here for more detailed information

### Upcoming Workshops

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### Nvidia Workshop

**Nvidia Workshop**

**Nvidia workshop** taught by Nvidia staff. **Free lunch.** Pizza will be provided at Noon. This workshop will have Nvidia staff present. You can learn about their technologies particularly with Machine Learning and AI, ask them questions.

#### Abstract

In this session we will cover some of the most popular and effective GPU accelerated libraries that give high performance without the requirement of writing your own custom GPU code. We will cover CUDA-X which has libraries for math, image/video processing, deep learning, and GPU tailored partner libraries. On top of CUDA-X we will cover RAPIDS which will target data science and data analytics workloads. We will conclude the session with interactive coverage of NVIDIA's profiling tools. We will conclude with a brief coverage of Python specific tools we have like CuPy and Numba for customizable GPU accelerated code. By the end of the workshop, you'll have the skills to utilize existing GPU accelerated libraries and write your own Python codes with NVIDIA GPUs!

#### Learning Objectives:

- Introduce RAPIDS and CUDA-X for drop-in GPU-accelerated libraries
- Introduce CuPy and Numba for GPU accelerated Python code
External Resources Training

Data Science Institute

The Data Science Institute is a UArizona organization that provides training, support services, and connections for those in the computing/data science community:

The Data Science Institute facilitates collaboration across an increasingly diverse and active Data Science community by providing workforce development, essential technological assistance, and training to University partners. Formerly Data7, the Data Science Institute aims to foster the next generation of data-driven research by encouraging university-wide interdisciplinary collaboration, gaining external visibility, developing industry alliances, and increasing funding for research at the University of Arizona (UA).

For a list of upcoming training workshops, see: https://datascience.arizona.edu/calendar

Self Guided Training

Linux

Linux Self Guided

We run RHEL/CentOS 7 Linux on our high-performance systems. If you have never used Linux before or have had very limited use, read this useful guide: http://www.ee.surrey.ac.uk/Teaching/Unix/

Or try this one:
https://www.pcwld.com/linux-commands-cheat-sheet

Shell Computing

https://effective-shell.com/

Matlab
Matlab Training

Matlab Online Training

Matlab offers a number of free tutorials including these ones:

- Training Overview
- Machine Learning Onramp
- Deep Learning Onramp

Resources from the recent workshop:

- Slides and Exercises from today’s workshop can be downloaded at: https://tinyurl.com/DeepLearning-MATLAB-Arizona
- Free online training - Introduction to MATLAB - MATLAB Onramp
- Free in-depth MATLAB training – MATLAB Fundamentals
- Free online training - Introduction to Deep Learning – Deep Learning Onramp
- Free in-depth Deep Learning training - Deep Learning with MATLAB
- More Resources (e-books, videos) and Examples (to help you get started with your projects)
- University of Arizona MATLAB Portal Page (Access and download MATLAB, MATLAB Online, Self-paced trainings, Technical Support and other resources)

Matlab Workshops at UArizona

Deep Learning In Matlab

October 28, 2021

Learn how you can use MATLAB to apply deep learning techniques to your work whether you’re designing algorithms, preparing and labeling data, or generating code and deploying to embedded systems. For resources shared at the workshop see the bottom of this page.

Details

Tackling Big Data with Matlab

April 5, 2022

In this seminar you will learn strategies and techniques for handling large amounts of data in Matlab. New big data capabilities in Matlab will be highlighted including tall arrays.

Details

Singularity

Singularity Training

Singularity is now called Apptainer but it is functionally the same.

Singularity containers let users run applications in a Linux environment of their choosing. This is different from Docker which is not appropriate for HPC due to security concerns. Singularity is like a container for Docker images, but is not just for Docker.

The most important thing to know is that you create the singularity container called an image on a workstation where you have root privileges, and then transfer the image to HPC where you can execute the image. If root authority is an issue then the answer might be a virtual environment on your laptop, like Vagrant for MacOS

For an overview and more detailed information refer to:
Singularity Quick Start

Here are some of the use cases we support using Singularity:

- Portability and reproducibility
- You already use Docker and want to run your jobs on HPC
- You want to preserve your environment so that a system change will not affect your work
- You need newer or different libraries than are offered on HPC systems
- Someone else developed the workflow using a different version of linux
- You prefer to use something other than Red Hat / CentOS, like Ubuntu

Nvidia/GPU
GPU/Nvidia Training

Nvidia offers AI, Data Science and accelerated computing curriculum with access to GPU’s and course material. You can use our Nvidia GPUs also.

Nvidia Deep Learning Institute

See their web site for more information on the University Ambassador Program, Teaching Kits and Certifications

OpenMP

Introduction to OpenMP

This PDF file is a presentation from a series called Xsede * HPC Workshop.

* XSEDE, the Extreme Science and Engineering Discovery Environment, is the most advanced, powerful, and robust collection of integrated digital resources and services in the world. It is a single virtual system that scientists and researchers can use to interactively share computing resources, data, and expertise. XSEDE integrates the resources and services, makes them easier to use, and helps more people use them.

Data Center Video Tour

You may not get to see the actual supercomputers where you work is done, but you can watch this tour. Note how loud it is in the room. The video does not convey the temperature of the room, but there are no warm areas. As you will hear explained, the cooling is done with chilled water.

Your browser does not support the HTML5 video element