RESEARCH COMPUTING BOOTCAMP
JANUARY 19-29, 2021
Princeton Institute for Computational Science & Engineering
Center for Statistics & Machine Learning
OIT Research Computing

WEEK 1: ESSENTIALS OF RESEARCH COMPUTING

A PRIMER ON COMPUTING RESOURCES
- Linux Command Line (beginner & advanced sessions)
- Getting Started with the Research Computing Clusters
- Data Transfer Basics & Best Practices
- Introduction to the Cloud

PROGRAMMING LANGUAGES
Beginner & Intermediate sessions on various topics in:
- Python
- R
- MATLAB

VISUALIZATION
- How to Make Effective Plots
- Hands-on Parallel Sessions in Python, R, MATLAB
- Scientific Visualization

RESEARCH SOFTWARE ENGINEERING
- Good Practices for Research Software Engineering
- Version Control using Git
- Sessions on Debugging, Testing, and Profiling Code

WEEK 2: INTRODUCTION TO HIGH-PERFORMANCE COMPUTING (HPC)

BACKGROUND & FUNDAMENTALS
- What Every Computational Researcher Should Know About Computer Architecture
- Floating-point Arithmetic is Not Real
- Overview of Parallel Programming Paradigms
- Performance & Vectorization

GPU WORKSHOPS BY NVIDIA
Two day-long NVIDIA workshops on the following topics (instructors from NVIDIA):
- GPU “bootcamp” for HPC
- Fundamentals of Deep Learning

PARALLEL PROGRAMMING WORKSHOP BY INTEL
A day-long hands-on workshop on parallel programming in C/C++
(instructors from Intel)

NOTE: Some familiarity with the command line and with C/C++ or Fortran is necessary for most or all of the Week 2 sessions. “Fundamentals of Deep Learning” also requires experience with Python.

Organized by Princeton Research Computing, a consortium of campus groups led by the Princeton Institute for Computational Science & Engineering (PICSciE) and OIT Research Computing

Participating Departments: Center for Statistics and Machine Learning, Chemistry, Geosciences, IRIS-HEP Software Institute, Lewis-Sigler Institute for Integrative Genomics, Molecular Biology, Office of Population Research, Princeton Plasma Physics Laboratory, Program in Applied & Computational Mathematics

To register, and for more information, visit: researchcomputing.princeton.edu/workshops