Anytime, Anywhere
The Cyberinfrastructure Tutor (CI-Tutor) offers a wealth of online tutorials to the high performance computing community.

How does someone learn about parallel programming, high performance computing (HPC), and all of the aspects of conducting computational and data enabled science and engineering (CDSE)? What are the options to learn this material “just-in-time” so you can apply the techniques and methods when you need them? There are so many online options to learn, how do you know which are of the best quality?

The answer is the Cyberinfrastructure Tutor (CI-Tutor). This unique resource offers the high performance computing community a wealth of online tutorials they can take at their own pace from anywhere and at any time of day or night.

Over the last ten years, more than 47,000 researchers, educators and students have found the answers to these questions by turning to CI-Tutor. With support from TeraGrid, CI-Tutor offers a free, web-based training site for high performance computing and cyberinfrastructure related topics. The site, hosted by the National Center for Supercomputing Applications (NCSA) at the University of Illinois, Urbana-Champaign, offers access to training on HPC and CDSE topics via online, self-paced learning modules.

Currently, CI-Tutor provides a broad range of CDSE and HPC topics including:
- BigSim: Simulating PetaFLOPS Supercomputers
- Debugging Serial and Parallel Codes
- Getting Started on the TeraGrid
- Intermediate MPI
- Introduction to MPI
- Introduction to Multi-core Performance
- Introduction to OpenMP
- Introduction to Visualization
- Multilevel Parallel Programming
- Parallel Computing Explained
- Parallel Numerical Libraries
- Performance Tuning for Clusters
- Tuning Applications for High Performance Networks

“The TeraGrid is helping to bridge the HPC gap for faculty and students at Florida International University,” says S. Masoud Sadjadi, Assistant Professor in the Autonomic Research Laboratory at the School of Computing and Information Sciences at (FIU) in Miami, Florida. Sadjadi and his team saw tremendous value in the CI-Tutor materials for his courses and sought assistance from NCSA to incorporate the online tutorials offered via CI-Tutor into a graduate course, Grid Enablement of Scientific Applications on TeraGrid, at FIU. Sadjadi says, “The material adapted for my Scientific Applications course will allow students in this class to use the TeraGrid systems as their playground for their class exercises and as the target platform for their research projects.”

Srirangam Addepalli, of the High Performance Computing Center at Texas Tech University in Lubbock, Texas, was in the process of setting up a training web page for the Center’s users when he came across the CI-Tutor website. He found it to be “the most comprehensive collection of training materials” and sent a request to NCSA asking if they could redirect their users to CI-Tutor for training.

Sudheer Kumar, of the Sri Sathya Sai Institute of Higher Learning in India, said, “I am quite impressed with the NCSA CI-Tutor web resources. In particular, I found the course Introduction to Multi-core Performance very useful. I used all the available material in my course. It is very comprehensive and interesting. All the students liked that course very much. Thanks to CI-Tutor.”

The CI-Tutor collects feedback from users of the site to assess the impact of the content and to collect suggestions for improvement. For the survey responses about the MPI course, over 80% of the respondents rated the tutorial as very good or excellent, and over 93% of the respondents said that the knowledge they gained from using the tutorials will improve the quality of their work.

The following are examples of the survey comments received:

“Found the first course easy to assimilate, and I believe taking further courses will enhance my knowledge even more, which will give me the ability to build, debug, and operate grid systems at the speed and quality I expect from myself and improve my skills the way employers appreciate.”

“The information is formatted in portions just the right size for the subject matter at hand, and it is organized in a way that makes it easy to remember. Also, including vocabulary links makes it much faster to read through and understand.”

“I think that it is very useful for the following three reasons: it presents the user with methodically organized information, it allows skipping some chapters that are less needed at the start, and the self-tests and course problems are good for establishing a better knowledge base.”

While there are many positive comments in the surveys, there are also numerous constructive suggestions for improving the materials. The feedback is used for periodic updates and modifications to the tutorial content, such as the MPI materials, which have undergone two major revisions to improve the content of the tutorial.

This excellent resource continues to improve by providing new topics as well as refining and updating existing materials in response to the education and training needs of the community. You are encouraged to utilize the resources and to share your own perspectives and needs.

Relevant links:
- CI-Tutor: http://ci-tutor.ncsa.illinois.edu/
- National Center for Supercomputing Applications: http://www.ncsa.illinois.edu