

Introduction to Volume 8 Issue 2

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Forward

In this issue, Sharma describes a model scientific computing course at a liberal arts college. The course focuses on scientific data analysis and data visualization using Mathematica and a variety of open source tools for molecular visualization. It provides a description of the hands-on exercises and student assessments of the experience.

The article by Shamir describes a model for an undergraduate research experience in computer science that has been implemented at his institution. The program has resulted in about 40% of the undergraduate majors participating in the research experience across a wide range of topics.

The other articles in this issue detail the internship and research experiences of five students and their faculty mentors. Alford and Toth describe a project that compared the cost, power consumption, and computational efficiency of ARM-CPU systems with a regular cluster performing virtual screening with AutoDock Vina.

Haddad et.al. tested a new algorithm for the computation of Bayesian networks that generates multiple networks in parallel to help remove the bias of other approaches. They demonstrated a major performance gain through 64 processors after which the communications overhead resulted in wasted computational resources.

Isokpehi and his students used the Blue Waters Supercomputer to analyze the information from microbial genomes. They then used several data analytics tools to visualize the similarities and differences across a 547 annotation files for the Rhizobiales genome.

Peterson et.al. describe the contents of a computer science course for high school students with a capstone project of building an n-Body simulation. They report a number of challenges faced by students in the course along with the results of the final project.

Finally, Yu and Mark describe their model for the interplanetary low-thrust trajectories from Earth to Mars for spacecrafts supplying necessary cargo for future human-crewed missions. They were able to achieve significant speedup in the application after parallelization.