Scientific Computing

Scientific Computing Cluster

Students with good mathematical skills should consider a track in scientific computing, also called computational science.   This is a blend of computer science, applied mathematics, and discipline science such as physics, chemistry, or perhaps geology. Jobs for experts in scientific computing exist with the Department of Energy laboratories (Savannah River, Oak Ridge, Los Alamos, etc.) or the aerospace, automotive, or petroleum industries, to name three examples.

Most scientific computing problems are large-scale problems, and parallel computing is necessary in order to have the programs finish in a timely way.   Most problems also generate large amounts of data, so visualization is used to view the data to gain insight rather than just have numbers as output.

Course Requirements

We have faculty members who specialize in algorithms and architectures for scientific computing in a variety of fields and regularly teach courses in these areas. Exceptionally well prepared students should consider a double major in Computer Science and in Mathematics.   This can be done with a careful choice of coursework with no additional credit hours required beyond that for the two majors.

Computer Science Electives:
- CSCE 564 Computational Science
- CSCE 565 Computer Graphics
- CSCE 567 Visualization Tools
- CSCE 569 Parallel Computing

Mathematics Electives:
- MATH 520 Ordinary Differential Equations
- MATH 521 Boundary Value Problems and
   Partial Differential Equations
- MATH 522 Wavelets
- MATH 527 Numerical Analysis