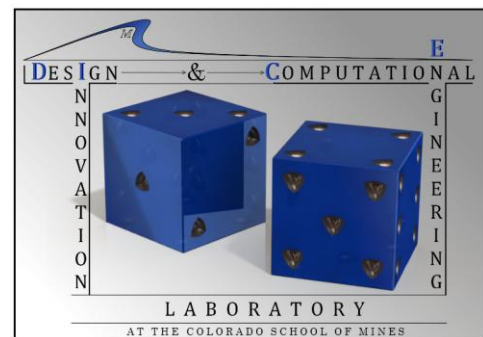


Web Deployment of Research Software

The Design Innovation and Computational Engineering Laboratory (The DICE Lab) is looking for a talented computer science student team to assist our research efforts. One of the key pieces of software developed by our research team needs to be made available to the larger research community. We envision doing so by creating a web-based interface that allows external users to submit jobs to a queue, with a CSM computer system then running those datasets and posting results back to the web.

The software in question is designed to model large datasets using spline mathematics (Non-Uniform Rational B-splines). Various optimization routines have also been recently added by different researchers. The code is written in older-style c++ (c with classes and templates). Unfortunately, the code is written by many users with a limited programming background, and can probably be improved substantially as well. A prior CS team worked on an improved version of the code, but further work is still needed to:

- Improve parallelization of the code.
- Incorporate several forks of the software into a master version.
- Improve readability and modularity
- Produce software compliant with the newest c++ standard.
- Implement a simple GUI to replace the current text-based UI.
- Improve the performance of algorithms wherever possible.
- If possible, incorporate GPGPU computing and parallelization principles to enhance performance.



This work offers other unique opportunities:



- Work with cutting-edge scientific software.
- Support an NSF research grant.
- Develop work experience highly relevant to a future industry position or graduate education.
- Work in an environment that respects your talents! We are not looking for someone to just write code. We are looking for a student who can fundamentally improve a piece of scientific software, and will consider any ideas or suggestions for improving, restructuring, or modifying the software in question.

If you are interested in this position, please contact: Dr. Cameron Turner by email at cturner@mines.edu, or in person in Brown Building W370E.