

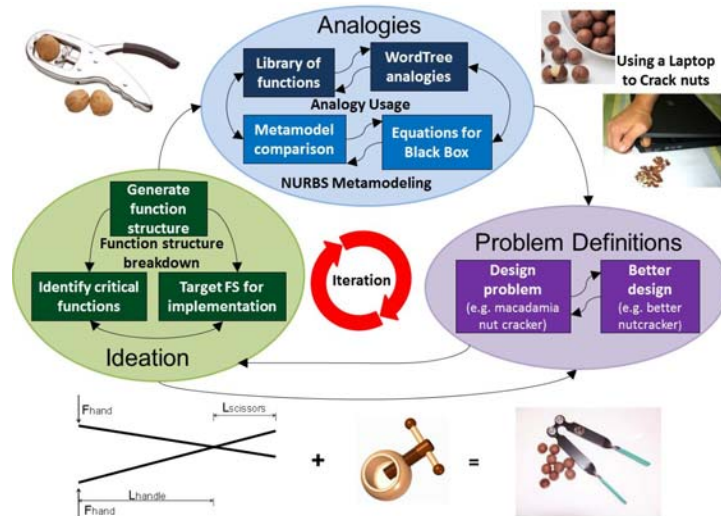
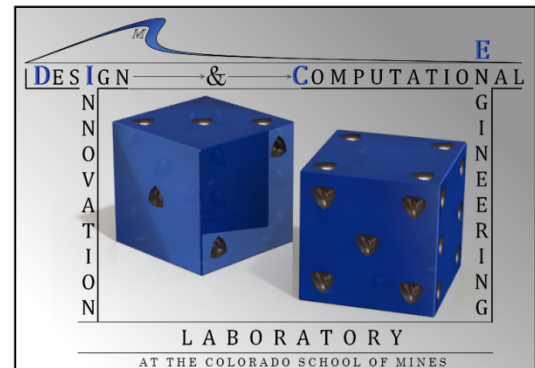
Database Search Algorithm for Analogy Software

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 our projects is in need of code development for use with a repository of design analogies. We envision doing so by creating a GUI interface that allows external users to search for analogous designs via engineering performance metrics, with a desired set of parameters to be optimized and then returning ranked results back to the user.

The proposed software will be designed to function with large datasets using Graph Theory-based approaches. The matching algorithm will be a practice in research and development beginning with a Graph Theory-based approach and possibly moving to other techniques. A GUI interface will need to be placed at the user metric search end and the library entry end of the software. The software will need an interface to insert, edit, and delete database entries while also storing the entries. The interface will accept engineering design functions as the input and will then return a list of possible analogy matches from the database. With these matches, a GUI interface would be returned to the user to show their options and the other potential avenues for options. The overall search will create a Wiki-like repository and search engine based off Graph Theory matching.

Work is needed to:

- Develop database repository (perhaps SQL)
- Matching algorithm to return entries of database
- Develop a GUI interface for manual library entries
- Develop a GUI for parameter search
- Perform test runs of analogy matching using code



This work offers other unique opportunities:

- Collaborate with current graduate students at CSM and paired universities.
- 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 envision 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 W370B or Briana Lucero at blucero@mines.edu.