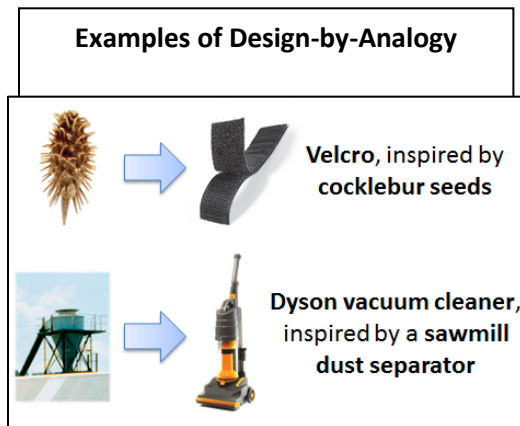




DRACULA: Design Repository & Analogy Computation via Unit-Language Analysis

The Design Innovation and Computational Engineering Laboratory (The DICE Lab) is seeking a talented computer science student team of 3-4 *students* to launch into and assist with our current NSF research endeavors. Currently, one of our primary research projects incorporates investigating the design and code development of a database repository for design analogies. The current database repository is in the initial stages of development and integrates the search for analogous design solutions with graph theory and isomorphic performance matching. Using the current code, interface, and repository, we aim to expand the scope of this Design-Analogy Performance Parameter System (D-APPS) to allow for greater multi-disciplinary collaboration in communicating analogous solutions to design problems and functionality.

The D-APPS tool, called DRACULA, provides a computer design interface for engineers of various skill levels in order to configure the critical functions of an existing design with optimizing the target performance design parameters. To provide engineers with compatible design solutions, existing designs have been consolidated into a database repository that includes features of the designs along with their critical functions and performance parameters. However, the current repository structure (Excel) is a poor choice for the database. To use the current repository, several manual steps are necessary to interface with a crude GUI (implemented in C++ via QT). Both the database and GUI are inadequate for use. In order to address this limitation, we seek to:



- ✓ Port the Excel data to a formal database program
- ✓ Develop a GUI to assist in the construction and maintenance of the database
- ✓ Redesign the Search GUI to allow for improved performance, user interfacing, and to enable optimization process research for this analogy search problem
- ✓ Implement a web-based interface for student evaluation in the Fall

This work offers other **unique** opportunities:

- ✓ Collaborate with current graduate students at CSM and the Georgia Institute of Technology
- ✓ Support an NSF research grant, including possible follow-on employment
- ✓ 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 students 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 project and want to know more, please contact:

Dr. Cameron Turner by email at cturner@mines.edu, or in person in Brown Building W370B