

Students At Work

The Natural Sciences and Engineering Research Council of Canada (NSERC) is the national body in Canada that strategically invests in the country's scientific and technological capabilities. To stimulate student interest in research in the natural sciences and engineering, and to encourage graduate studies and research careers, NSERC offers Undergraduate Student Research Awards (USRA).

Derrick Shum, now entering his 3rd year as an undergraduate at the University of Toronto, won one of these awards to work at Rocscience this past summer.



Derrick Shum completed 2nd year of Mechanical Engineering at the University of Toronto this past spring. During his summer internship at Rocscience, Derrick worked on several projects focused on 3D modeling for finite element analysis. Derrick also tested Rocscience software for any bugs, updated information in *RocProp*, a rock database, and investigated import of 3D solid models from other software into *Examine*^{3D}.

Utilizing his knowledge from solid mechanics, Derrick learned about geomechanics and how the finite element method works. He went on to create finite element models described in manuals, papers, and journal articles. He analyzed these models and compiled two manuals – a verification manual and a manual with examples – for a 3D finite element program currently under development. These two manuals will be included in future documentation for the 3D program.

Derrick tested four of Rocscience's most popular programs for bugs. He provided feedback that helped improve these products and meet user expectations. Derrick updated the rock properties information in *RocProp*. As a result, the database now provides users with records of high quality rock triaxial tests. Derrick also looked into the use of 3D solid modeling programs, such as Rhino, to create geometric models for *Examine*^{3D}. This work will help facilitate easy creation of complicated underground excavations in *Examine*^{3D}.

Derrick is continuing his studies at the University of Toronto and plans to specialize in Solid Mechanics and Heat and Mass Transfer. His experience at Rocscience has helped him on his way to becoming a well rounded and versatile engineer.