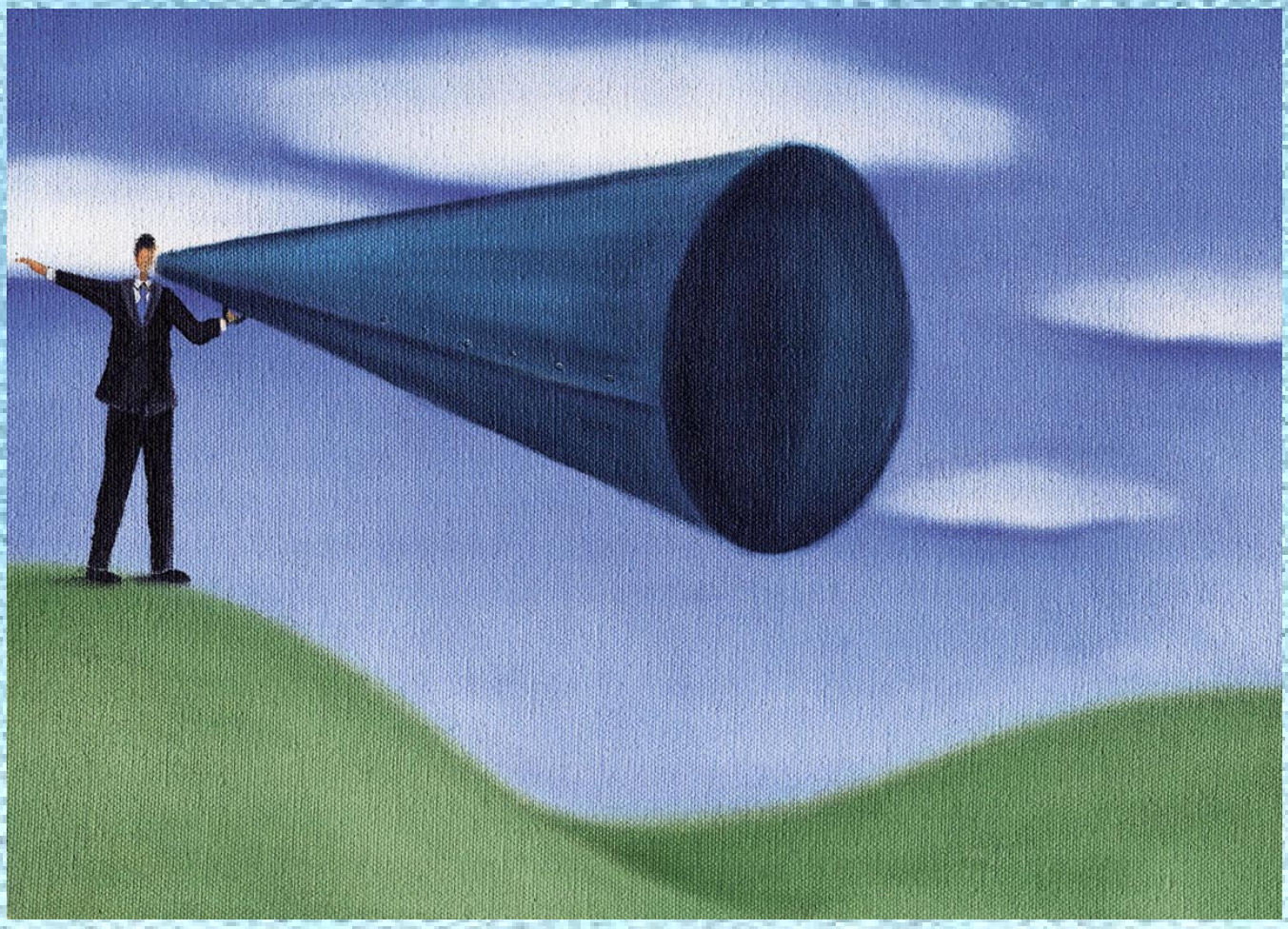
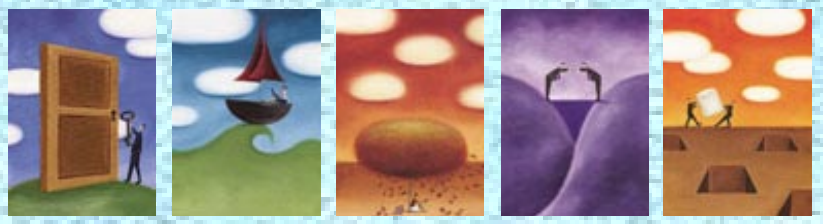
Building Connections



Education and Industry Have a Voice in Software Development

Rocscience Education Program • Student Internships
Short Courses • Knowledge Transfer & Collaboration
Other Educational Resources



Rocscience Inc., which originally grew out of the University of Toronto, has evolved into the international software company that it is today. We have always valued our academic roots and we believe that encouraging the relationship between education and industry is the best way to enhance both communities.

Much has been said and written about the fact that industry needs qualified engineers that are well prepared to take on today's challenging and complex geotechnical opportunities, from the small consulting company to the larger well-established engineering firm, from the small remote mining operation to the big players around the world. Where are these companies going to find the bright minds as they finish university and how are these students going to be encouraged to pursue a career in geo-engineering? Where do research ideas come from that are relevant to the work going on today and how does this new generation of geo-engineering students become convinced that this is their future?

Rocscience believes that a close collaboration between education and industry is crucial to the future of both. With over 4,000 companies and 100 universities using Rocscience software, we believe that we can make a difference. Rocscience has therefore been active in various activities such as the Rocscience Education Program and our Student Internships. For Short Courses being offered in the geotechnical area, we provide the use of Rocscience software at no charge to the organizers, often university professors, who have used the software and can appreciate its educational value. Our company is also active on the knowledge transfer front through software solutions in areas such as slope stability using shear strength reduction (SSR), risk analysis and 3D settlement, to name a few.

Rocscience Education Program

Every September, it seems that our attention is drawn to education. As the school year gets under way, we are contacted by anxious professors who want to make sure their Rocscience Education Program subscription is renewed, and that our software is up and running in their labs. We select a "Top Project" undertaken by students, and review the work done by our own summer students, as they head back to school.

Our Rocscience Education Program has been growing for the last five years, and we now have over 100 leading universities and colleges from around the world who participate. Our goal is to provide our software to educators to use in the classroom, helping them to teach key approaches to today's most relevant geotechnical engineering problems. We provide fully functional versions of all of our windows programs each year to our registered universities for a nominal fee of $250 per year. The suite of software is installed on a departmental server so that students can work on their assignments and projects using these geotechnical tools.

The diversity of the participants keeps us on our toes. Universities from B.C. in Canada to Florida, USA, from Helsinki to Beijing, are involved in the education of students around the world. Departments of Mining Engineering, Civil Engineering, Geology, Earth Sciences all find the programs invaluable in their classes. Professors teaching courses as diverse as Physical Vulcanology, Engineering Geology and Site Investigation as well as Rock Mechanics and Slope Stability incorporate Rocscience software into their teaching programs. Getting feedback from professors teaching such diverse material, in such different parts of the world, is a great way for us to refine the programs, and keep making them more user friendly. Feedback from professors who are leaders in geotechnical research is also an invaluable way to promote the sharing of knowledge between industry and academia.

Our goal is to keep expanding the Rocscience Education Program, developing new and innovative ways to collaborate with universities. Every year we ask professors to submit interesting projects and problem sets that they have assigned to their students. We envision that these will become a great teaching resource for professors, who are always looking for interesting new ways to present their material. For the new professor, organizing their courses for the first time, these examples will make it much easier to organize problem sets and will encourage them to take advantage of the university's participation in the program.

Student Internships

Every summer we have a number of students who undertake projects at Rocscience. This is a great way for us to stay connected and inject some energy, enthusiasm and new ideas. Students have undertaken projects such as developing a database program for rock properties, and working on a project to develop a real-time 2-D Windows program for analyzing stresses around underground excavations.

This year's summer projects are detailed in this issue RocNews, Students at Work. Our experience with summer students has been very positive that we now plan to hire co-op students throughout the year.

Short Courses

Education is something that we focus on year-round; it is integral to Rocscience. We often receive requests from experts in the field to use Rocscience software in their Short Courses. We are happy to provide the means to the course organizers to either install the requested programs on their server or have each participant do the installation on their individual laptops, allowing them to take the programs back to their offices for continued use for several weeks.

The feedback that we get from these participants, who typically are working professionals attempting to keep their engineering knowledge up to date, is invaluable. These people bring their experience and concerns from current projects to the table for all to share and discuss. Since these courses are geared to increasing the knowledge and ability of the engineer through the application that they are familiar with on a daily basis, the course, and the software used, must be relevant.

Knowledge Transfer and Collaboration

Software is an active medium of knowledge. Unlike knowledge in written form, which is inert or passive, software can be executed. Of the two, knowledge in the form of software is by far the form most readily applicable to solving problems. Besides our direct involvement in the education field through providing our software to universities and short courses, Rocscience is committed more broadly to contributing to the canon of geomechanical knowledge through our research and development, with an eye on how this will eventually translate into knowledge through software. The challenge for us as a company is how to transfer scientific research into software that not only facilitates the use of new powerful analysis tools but also allows the engineer to better understand the interrelationships and interdependencies among the different factors at play in problems they are working with in ways written knowledge cannot. It is through the use of knowledge by a large group of people that the ideas evolve and improve.

Geomechanics software development is not a trivial exercise in just transforming known theoretical concepts into computer algorithms. It is exciting work, integral to the practice and advancement of science and engineering. It generates new knowledge of significant scientific value in diverse ways and catches the attention and enthusiasm of the students that industry is trying to attract. We are committed to undertaking this research, implementing and extending techniques such as the Shear Strength Reduction Method for practical use in slope stability analyses.

We want to collaborate closely with practioners in the field who are using our software on a wide variety of projects. Often the process of solving a consulting problem leads to improvements in our software, which benefits our entire customer base and helps propel the research. We have noticed that there is a considerable gap between the state of the art in geomechanics research and professional practice. We believe that the active development of computational algorithms based on cutting-edge research can help narrow this gap. The sharing of knowledge is key in building connections between academia and industry.

It is our hope that software will receive greater attention as both an important teaching aid and as an indispensable industry tool, and will receive greater attention from both areas. Knowledge incorporated into software will go a long way in advancing the real-world practice of geomechanics. The sharing of knowledge is a major Rocscience goal, one that can be of benefit to the geotechnical field as a whole, both academics and industry.

Other Education Resources

Our website is also a source of many free and accessible educational tools. It contains useful resources to enhance instruction and supplement the software, including extensive software manuals, verification manuals and on-line tutorials, research/white papers, a project gallery, and RocNews, our quarterly newsletter filled with user tips. For information, click on the links below.

Software and Verification Manuals, On-Line Tutorials
http://www.rocscience.com/support/Support.asp

Research/White Papers
http://www.rocscience.com/library/Papers.asp

Project Gallery
http://www.rocscience.com/library/ProjectGallery.asp

RocNews, our quarterly newsletter filled with user tips
http://www.rocscience.com/library/RocNewsContents.asp

Practical Rock Engineering, Dr. Evert Hoek's vital reference tool
http://www.rocscience.com/hoek/Hoek.asp