June 23, 2011

Dear Alumni and Friends of ORIE:

My first year as Director has passed in a blur, and it is time once again to update you on goings on in ORIE.

**Strategic Planning**

In line with University and College of Engineering activities, ORIE has been busy developing a strategic plan.

The University plan ([www.cornell.edu/strategicplan](http://www.cornell.edu/strategicplan)) is based on an aspiration “to be widely recognized as a top-ten research university in the world, and a model university for the interweaving of liberal education and fundamental knowledge with practical education and impact on societal and world problems.”

Engineering Dean Lance Collins recently met with the ORIE faculty to discuss progress towards an Engineering College strategic plan. That plan will be driven by Cornell’s aspiration to become a top-five engineering college in the world.

ORIE’s strategic plan is well-aligned with the University and College plans. It focuses on strengthening the School’s current position as a world leader, by

- maintaining the School’s eminence in the foundations of optimization, probability and statistics,
- continuing to build our interdisciplinary footprint in service sector systems,
- emphasizing financial engineering, healthcare, and e-commerce/supply chains (all examples, incidentally, of the evolution of the word “Industrial” in our name to the word “Information”).

You will find specific steps towards accomplishing this elsewhere in this letter.

**ORIE Ranks High**

As reported recently by the National Research Council, ORIE is among the top five programs in the US, not just among OR departments, but in the category that includes graduate programs in OR, Systems Engineering, and Industrial Engineering. In fact ORIE is one of the highest ranking units in the entire university. Our reputation has been built largely on our work on the foundations of operations research, but over the past decade our hiring emphasis has been towards applications: we now have a healthy balance, with many professors contributing significantly to both fundamental theory and important applications.
The rich interplay of theory and practice is a hallmark of ORIE research. A powerful illustration is a current interdisciplinary research project involving undergraduate, M.Eng, and Ph.D. students, funded in part by the National Science Foundation, on emergency medical response systems. In this research project, teams develop applied probability models of the response process; perform statistical analysis on data representing demand, travel times, and other attributes; develop simulations for use in exploring alternative strategies; and use optimization techniques to carry out the search for the best approach. This practical work is also driving fundamental research on decision-making under uncertainty.

The ORIE strategic plan includes this and other case studies, including one on e-commerce supply chains and one on computational sustainability. Each case displays a ‘virtuous cycle’ in which applications are enabled through the theoretical, computational, and modeling advances made in ORIE, and the applications spur new developments in theory and computation. These applications illustrate what is becoming known in industry and other organizations as “Analytics,” essentially a new term for Operations Research.

Dean Collins has noted analogous blends of activity in many important research areas in engineering, and he encourages ORIE involvement throughout the college. He sees areas such as Energy and Sustainability, and Network Science and Computation as important growth opportunities, and anticipates increased interaction with industry and increased entrepreneurial opportunities for faculty and students. The ORIE strategic plan includes a focus on these emerging areas, and we hope to expand our already successful approach to collaboration with industry.

**Establishing Centers**

The ORIE strategic plan suggests two new centers that might strengthen and focus research activities in emerging areas of interest:

- a Center for Risk Management that would provide a common umbrella for risk management research relating to fields such as financial engineering, healthcare operations and climate modeling; and
- a Laboratory for OR Advice and Consultation to respond to inquiries about consulting (often from alumni), expose our students to real-world problems in industry, and provide access to new and challenging research issues.

Managing such centers would require new personnel: current faculty are overstretched by multiple demands, including administration, large-scale undergraduate courses, and the pursuit of research funding. A major goal would be to leverage such centers for enhanced collaboration with industry and across Cornell.
Adding Ph.D. Students

Ph.D. students are absolutely vital to the health of cutting-edge engineering departments, underpinning most research endeavors on the one hand and most undergraduate and M.Eng. teaching on the other (through their work as Teaching Assistants). Some years ago, the College of Engineering proposed an ambitious ‘rule of thumb’ for the relative sizes of undergraduate, M. Eng. and Ph.D. student populations, aiming at the ratio 3:2:1. ORIE’s current ratio is more like 4.4: 3.7: 0.4. The ORIE strategic plan calls for a 25% increase in the number of Ph.D. students. Strong student candidates are available (with suitably energetic recruitment), and faculty are enthusiastic, but a key requirement would be an increase in funding. Indeed, growing Ph.D. Fellowship support is among ORIE’s top development goals. Recent media murmurings about worldwide overproduction of Ph.D.’s are simply not valid in our field: our placement of graduating students into academic positions is on a par with our two major competitors, Stanford and MIT, and non-academic placement is also strong.

Hiring New Faculty

At the heart of the ORIE strategic plan is the need and opportunity to hire new faculty, both early and mid-career. The growth surge that ORIE experienced 40 years ago has resulted in the likelihood of many retirements in the next few years. More than 40% of our faculty are now over the age of 60 - somewhat above the College average. Other universities have similar profiles, so we expect stiff competition for top faculty, in both hiring and retention. Cornell’s Trustees have allocated funding to “pre-fill” positions in anticipation of retirements, since it is less expensive overall to maintain a top research presence than to have to regain it. We certainly hope to pre-fill aggressively.

This year we worked to fill two positions in financial engineering, one resulting from the retirement of Philip Protter and the other from the departure of a junior faculty member. We are delighted to welcome Andreea Minca as our newest ORIE faculty member, fresh from her Ph.D. in Paris: her expertise is in models of systemic risk in complex financial networks. We look forward to another round of faculty hiring in the coming year.

Alumni Involvement

Our strategic plan also emphasizes the need to connect and engage with alumni such as you. Contact with our alumni gives a key barometer for ORIE’s success. In particular, we plan to create an Alumni Advisory Council for the School. Such councils have thrived in other departments in the College. Challenging and leveraging ideas through a committed group of key alumni would be an excellent opportunity for ORIE.
I am extremely grateful for the continuing support of alumni and friends. Whether through large gifts or small, we need your support for our students, faculty, and facilities. Unrestricted gifts to ORIE enable us to address a wide range of needs and opportunities that arise over the course of the year. Other gifts target specific areas of need. For example, Dr. Arthur Geoffrion ’59, MIE ’61 recently established an endowment to help fund interactions of Ph.D. students and faculty with industry.

Alumni and friends help make ORIE a strong, vibrant school that produces exceptional graduates at all levels. For information on how to make your own gift, visit giving.cornell.edu.

My previous updates have called your attention to orie.cornell.edu/orie/alumni and orie.cornell.edu/news, web pages that can help you keep in touch with your School. More than a dozen new stories have appeared on the latter site since my last update to you; our news had more than a quarter million page views in 2010!

To these pages we have now added an expanded Facebook page, Cornell University School of Operations Research and Information. If you use Facebook, be sure to go to this page and “Like” it. News and other items are posted there. They are also posted on a School of Operations Research and Information Engineering group on LinkedIn that you can join. Check out both of these sites, and let me know your reaction.

I am eager to hear your reaction to the directions your School has moved in recent years and to our plans for the future. Keep in touch!

Best wishes,

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