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COLUMBIA BUSINESS SCHOOL

Columbia Business School International Faculty Profile

Sergei Savin,
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Sergei Savin is an associate professor in the Decision, Risk and Operations Division at Columbia Business School. Originally from Ukraine, Savin has been at the School since 2000. He teaches the core course Decision Models, an elective on the art and science of modeling and a doctoral course on optimization.

What interesting research are you working on?

I spent the summer working on a research project with European colleagues. My specialty is healthcare operations, which is where we help healthcare institutions to become more efficient and cut their costs. In this case, the project we worked on is in England. As you may know, the largest portion of revenues for many hospitals comes from surgeries—both in the UK and in the U.S. So, a typical hospital would aim at discharging patients as quickly as feasible after the actual surgical procedure. We all know that hospitals need to be concerned about discharging patients too quickly, but from an economic perspective, they also need to make sure they can discharge patients when they are ready and not have them take up critical bed space.

At Charing Cross Hospital in London, which is the institution I worked with as part of a joint project between Columbia Business School and Judge Business School (part of the University of Cambridge), administrators were concerned about length of stays growing and the fact that the hospital was not being compensated for it. So we studied different procedures and lengths of stay associated with them and how the hospital's practices influence lengths of stay. Charing Cross Hospital wanted to analyze how the portfolio of patients they have reflects the portfolio of lengths of stay, which will enable it to align its revenue with an adequate length-of-stay exposure.

How do you go about evaluating the data the hospital gives you and coming up with an optimal set of solutions?

Our main contact is the chief information officer of the hospital, and our mandate is to explore opportunities for reducing the average length of stay, since the hospital is paid by procedure and not by length of stay. If a procedure is performed, it receives revenue from the NHS. So if the hospital can, it is in its best interests to discharge patients earlier. It's a concern in the U.S. as well, because even though the compensation works differently, the idea is the same. In many cases, observed lengths of stay are dictated by medical necessity and cannot by changed. However, in some cases, you can manage length of stay by managing the scheduling of tests that are needed before discharging a patient.

Are there any issues that make the analysis difficult?

There are a lot of variables that make finding an optimal length of stay per procedure difficult, in practice. For one, there are a lot of politics at work. The top doctors have more clout in securing laboratory resources, so even if one doctor's request should have priority with the lab based on the procedure he or she is performing, it does not always work that way. And the government in the UK is one tough customer—if the NHS says it won't compensate the hospital for a particular procedure, it is very hard to overturn such a decision. The centralized healthcare system creates challenges, but it also has some advantages. As an individual, you have a right to see your doctor within 48 hours in the UK. So while the system is less flexible, everyone has a minimum standard of care.

Why do you focus on healthcare? Why not a more traditional field, such as finance?

The medical field is, to me, the most important area in which to apply mathematical models. Back here in the U.S., healthcare is obviously far from being in its ideal state, and there is a lot of room for improvement. And that offers great opportunities for me. Being in New York, I have the chance to work with the Columbia Medical Center. I have worked with the Columbia Presbyterian Hospital to improve its MRI scheduling practices so that people will have to spend less time waiting for procedures. It is all about determining how to best utilize the existing healthcare capacity to improve the level of service for patients and the amount of revenue for hospitals. I am also currently working for one of the New York hospitals on developing a forecasting model for its midnight census—this is the number of patients it expects to have in its facility). Again, it is about the optimal utilization of the hospital's bed capacity to make sure resources and capacity are there to provide for patients.

It sounds like a lot of the work you do is similar to the problems students tackle in the core Decision Models course, no?

This is all directly related to the methods we study in class. Of course, it is much more detailed and sophisticated. But it is very interesting to work on because the healthcare industry has not made its way enough in terms of using complex decision-modeling techniques. Other industries, like finance, are way ahead of it. As a result, there is an enormous amount of interest from doctors, whose primary focus is on treating patients, to help manage the whole process. And that is precisely where we come in—there is no shortage of demand and there are a lot of professionals in the medical field who want to learn better practices. Doctors are smart people, but they are not necessarily "operationally" smart. They are not specialists in the efficient running of a service business, and we are. They know how to deliver care to a patient, while we know how to best organize that delivery.

What is your background, and how does your interest in healthcare fit in?

I have two PhDs: one in physics and one in operations. Both are from the University of Pennsylvania; the operations one is from Wharton. But if I could start again, I would probably opt to work in the medical field. Working on the projects I do is the closest you can get to having a humanist agenda. I really feel that healthcare is a sector where human and operational interests all interact. And I genuinely like the whole idea of improving people's well-being. It really is the next best thing to being an actual doctor, because I am helping them help their patients.

Do you have any interest in returning to Eastern Europe at some point?

I have been in the U.S. for 15 years and have an American passport. This is my home. That being said, I would definitely entertain the prospect of going back for some kind of temporary assignment. One interesting prospect is the Moscow School of Management, which just recently opened. It would be interesting to teach business there for a short stay. It would be a great opportunity for me to go back and see how much everything has changed, since I have not been there for 15 years. I have been waiting on Russia's transition to firmly take place before going back.

What do you prefer: teaching or working on your research?

I love teaching because I get to work with so many people who are young and energetic. To me teaching is not an obligation, it's a pleasure. When I first started, standing in front of 65 people was very intimidating. As the professors, sure, we know the methodology. But teaching is obviously much more than explaining the methodology. And it does not end at the end of the course or even at graduation. I constantly get feedback from people asking me about Solver and Crystal Ball, especially from people who have gone on to work at banks.

My favorite thing about teaching is seeing when a student's eyes change suddenly, reflecting a birth of understanding. It's almost like an act of creation, and you don't get that feeling in many situations. The students at Columbia will be making the future of this country in 5 to 10 years after their graduation—it's a great pleasure to take part in shaping this future.

You are known for requiring that students who arrive late to your class bring you a cup of coffee [decaf]. How did that rule come about?

I grew up in a conservative country. Rules are rules, and it took me time to adjust to the U.S. way of doing things. So the coffee is my compromise. But is has to be decaf, only. I made the mistake of not specifying this in the first couple of semesters, and I had to pay for it!

I would prefer it if people came on time. I don't think I am too draconian, though, because some of the other professors are known for locking the doors to keep late students out!