matrix inequalities, which demanded coverage in a textbook. We resisted the temptation to write only about these latest developments, however, and wrote a more balanced account with selected material from earlier techniques (model reduction, coprime factorizations, Riccati equations, and mu-analysis). This approach resulted in a relatively self-contained, stand-alone course. This ended up being a good idea since, as the heyday of robust control went by, few institutions would devote a long course sequence to this field. Using our book, most of the essence of the field can be delivered in a moderate amount of time. I think this is the reason why, more than a decade later, the book is still used in many universities worldwide.

Q. What are some of your interests and activities outside of your professional career?

Fernando: I have a beautiful wife and three sons, and I enjoy spending most of my spare time with them. I love to travel and try to include the family when possible. I enjoy sports (soccer, tennis), but after some injuries, I have mostly settled for biking along Montevideo's coastline. I enjoy reading about other intellectual interests (other sciences and philosophy), which I feel I could have pursued in another lifetime… As with most Uruguayans, I dabble in three entangled pastimes: spectator soccer, politics, and drinking mate. I even named my research group after this herb tea!

Q. Thank you for your comments.

Fernando: You are welcome. It was my pleasure.

IOANNIS (YANNIS) CH. PASCHALIDIS

Q. How did your education and early career lead to your initial and continuing interest in the control field?

Yannis: I completed my undergraduate degree in electrical and computer engineering at the National Technical University of Athens, Greece. Perhaps due to lack of resources, theoretical disciplines have a long tradition there, with control being the most prominent. Joining the Laboratory for Information and Decision Systems at the Massachusetts Institute of Technology (MIT)—well known for its strength in control—for my graduate studies was also an important contributing factor. At MIT I worked with John Tsitsiklis and Dimitris Bertsimas. Naturally, for a while I was straddling two communities, the control systems community and the operations research (OR) community. Not that they lack common techniques and ideas, but they are distinct in terms of style and main conferences. After graduating from MIT, I joined Boston University (BU), which has a great core group of control faculty. This influenced my research and the conferences I frequently attend. My work is still in many ways a derivative of my control and OR background, but it is the control systems community that I mostly feel a part of. It may not be a coincidence that my close friends describe me as someone who likes being "in control."

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Q. What are some of your research interests?

Yannis: I am interested in problems related to the control and optimization of complex systems. A large body of my work has considered stochastic networks and characterized the asymptotics of "failure" probabilities. Examples include probabilities of delays or losses in communication and sensor networks, backlog probabilities in supply chains, or probabilities of error in detection problems. Large deviations theory is an important tool in this analysis. Methodologically, the analysis involves an important convex optimization step since finding the asymptotic decay rate of a probability amounts to solving a variational problem. Once I have a good handle on the failure probability, I then like to pose control problems, considering, for instance, how the system can be controlled and/or optimized to minimize the failure probability of interest. I am also interested in stochastic dynamic programming and methods that address the inherent curse-of-dimensionality such problems exhibit, either by exploiting special structure or by approximate dynamic programming techniques. In my work, I like to consider very diverse applications areas, from communication and sensor networks to networks of autonomous agents, supply chains, cybersecurity, the smart grid, and even finance. The applications areas that motivate my research have evolved over time, initially manufacturing systems and communication networks, and more recently wireless sensor networks, cybersecurity, and some applications in robotics. I still maintain all these interests, but in the last few years I have become fascinated by applications of optimization and control in computational biology and health-care analytics. I have become heavily engaged in protein-protein docking, metabolic networks, and prediction and control problems that leverage the increasing availability of


Yannis Paschalidis.

electronic health records to improve health outcomes and optimize health care delivery.

Q. What courses do you teach relating to control? How would you describe your teaching style?

Yannis: I teach the graduate optimization "sequence" at BU. The sequence is organized in two courses, with the first course covering linear optimization, network flow problems, integer programming, and linear decomposition methods. The second course covers nonlinear optimization and modern convex optimization, including conic programming. My goal is not only to help the students learn the material but, mostly, to help them raise their mathematical maturity and learn how to think. When I teach, I use a combination of slides and the blackboard. My slides have notation, formulations, and statements of key results, but I always use the blackboard to carry out a proof. I find that using the blackboard regulates my pace and helps students see how to think when developing a proof. Students describe me as rigorous and very clear. In a recent evaluation one student wrote: "The professor is very nice, and sometimes he is just too nice." Well, I guess I have to work on that …

Q. What are some of the most promising opportunities you see in the control field?

Yannis: I'll return to two themes I alluded to earlier. There is an explosion of interest in networks as they are becoming central to the operation of many systems—control systems, of course, but also networks of autonomous agents, transportation, electric power, communication, biological, and social and economic. Control systems researchers have made important contributions to all these areas and are well equipped to lead the development of a science base for networked systems. A second opportunity exists in biology and health care. Biology and medicine are rapidly resolving some of the basic science around the operation of individual "components" and systems-level questions are now being asked. For instance, we now know a lot about individual proteins, and we are now interested in characterizing protein interactions with other proteins or small molecules (for example, drugs). As a control community we can make an impact. To do so, however, we need to deeply engage with domain experts and not stop at theoretically satisfying formalisms but seek practical outcomes of our work.

Q. You were recently selected as the inaugural editor-in-chief of *IEEE Transactions on Control of Network Systems* (*TCNS*). What are your aspirations for this new IEEE Control Systems Society (CSS) journal?

Yannis: All of us involved in this journal are excited about this 2014 launch. The CSS is among the first Societies to launch a journal in this new wave of "network" journals. We look forward for *TCNS*, as we call it, to become the premier journal publishing rigorous contributions in network systems. While *TCNS* is primarily interested in problems related to the control of network systems, we also welcome contributions concerning their design, study, engineering, optimization, and emerging behavior, as these can inform and guide design and control.

Q. What are some of your interests and activities outside of your professional career?

Yannis: Spending time with my wife and three sons, and swimming. As you can imagine, life is pretty busy with work and three kids. Yet, to maintain some level of sanity, I try to swim as often as I can. Swimming is also a family activity, since my sons swim competitively. I love the water. In the last few years, I swim a bit more systematically, as I have joined the masters swim team at BU. A swim practice is a great way to start my day, and I still try to participate in the occasional swim meet when that does not conflict with travel or with my sons' swim meets.

Q. Thank you for your comments.

Yannis: Thank you for this enjoyable discussion.

Profile of Yannis Paschalidis

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- *Notable awards:* INFORMS George E. Nicholson Award (second prize), 1997; NSF CAREER Award, 2000; U.S. NAE Frontiers of Engineering Symposium, 2002; Best protein docking prediction performance, 2009 CAPRI (Critical Assessment of Predicted Interactions) Evaluation meeting; Best Student Paper Award (on joint work with student), WiOpt 2011; IEEE Fellow, 2014.