John Tsitsiklis IEEE Control Systems Society Award, Acceptance speech Miami, Florida, December 2018

It is a great honor to be receiving this award. One of the reasons is the list of past recipients, where I see so many of the people that I have been admiring, and it feels great to be in their company.

Another reason is that I really feel that I am returning home. My very first conference paper was at a CDC, back in 1982. And since then, I have always felt that this is my core community, because of its broad outlook, but also because of its style, mathematically rigorous but driven by real problems.

Let me say a few things about my trajectory, and use this as an opportunity to recognize some of the people that played a critical role. I finished high school in Greece, did my undergraduate studies at MIT, and continued there for graduate school. I worked in LIDS, the Laboratory for Information and Decision Systems, and ended up staying there forever. LIDS was an intellectually exciting place, back then, and still is today. The place was full of energy and a key driver was the lab director, Michael Athans, and his inspring vision. At the time, the core theory of the subject was being consolidated, linear, robust, stochastic control, etc., and our community was branching off, with lots of optimism and ambition, in all directions: large scale systems, decentralized control, power systems, transportation systems, communication networks, you name it. Mike Athans made me an offer I couldn't refuse, a research assistantship with no strings attached, to just work on anything I wished. He was my thesis advisor, and I owe tremendous gratitude to him, for his support and inspiration.

For my thesis I worked mainly on distributed decision making, and in that context I connected with Dimitri Bertsekas who had just then moved to MIT. Dimitri was an expert in optimization and had gotten interested in distributed algorithms, in the context of resource allocation in data networks. We ended up working together quite a bit. We proposed and studied versions of deterministic and stochastic gradient descent that run over an asynchronous network, coordinated through a consensus algorithm. The storyline at the time involved loosely coupled workstations, an idea that subsequently lost steam. But it was interesting to see the subject resurface later, first in control theory, in the contect of multiagent systems, and more recently in the context of large-scale optimization for machine learning. Of course back then no one could have predicted this turn of events, but this experience reinforces the following thought. Instead of trying to tug along today's bandwagon, one can focus on clean and generic problems, on settings that feel and taste right. And then there is always a chance that the bandwagon will some day travel your way.

At the same time, I also started looking at systems and control problems from the point of view of computational complexity, which back then was a bit of a novelty in our field. I wish to recognize here the important role of Christos Papadimitriou, as a mentor and collaborator, and afterwards Vincent Blondel with whom we've had a long and fruitful collaboration.

Througout all this time, I also kept an interest in dynamic programming. It was the first course I ever taught, and I wrote some occasional papers on the subject. And then in the the mid-nineties, the planets were aligned. Dimitri and I dove into approximate and simulation-based dynamic programming, better known these days as "Reinforcement learning". Here, we were blessed to work with a cohort of incredible students. I would single out Ben Van Roy, whose insightful results and deep thinking actually drove much of the research agenda.

Overall, I was lucky to be engaged in the field of systems and control, or information and decision systems. Although some in the field are afraid that the future is not what it used to be, the field remains the intellectual core of many of the exciting developments that we see these days, which often involve processing information for the purpose of decision and control. There are always new twists, but the fundamentals remain the same, thus keeping our field alive and vibrant.

And I was lucky to have had so many great mentors, collaborators, and students, including many that I did not get a chance to name. This award belongs to all of them.