Profile of Giuseppe Notarstefano

- *Current position*: full professor, Alma Mater Studiorum Università di Bologna.
- *Visiting and research positions*: University of California, Santa Barbara; University of Colorado Boulder; and University of Stuttgart.
- *Contact information*: Department of Electrical, Electronic, and Information Engineering G. Marconi, Università di Bologna, Viale del Risorgimento, 2, 40136, Bologna, Italy, giuseppe.notarstefano@unibo.it, https://www.unibo.it/sitoweb/giuseppe.notarstefano/en.
- *IEEE CSS experience highlights*: associate editor, *IEEE Transactions on Automatic Control*; associate editor, *IEEE Transactions on Control Systems Technology*; associate editor, *IEEE Control Systems Letters*; associate editor, CSS Conference editorial board; and member, Technical Program Committee of the IEEE Conference on Decision and Control 2018.
- *Notable awards*: recipient of a European Research Council Starting Grant (2014), IEEE Transactions on Control of Network Systems Outstanding Paper Award (2021), supervisor of some Best Student Paper Awards, and a Best Italian Ph.D. Thesis in Controls.

need to also have toolboxes to rapidly run realistic simulations and experiments that were really implementing distributed algorithms and not just emulating them through "for" loops. So, as part of the activities of the OPT4SMART project that I coordinated, we first developed the Disropt package. It allows researchers to rapidly design distributed optimization algorithms and run them on multicore machines.

Then, since we have been working a lot in the last years on cooperative robotics, we decided to design ChoiRbot (a toolbox based on the novel Robot Operating System 2), which allows researchers to rapidly design distributed optimization and control laws, run them in realistic simulations, and easily conduct experiments with multiple communicating robots. I do believe that, as a community, we should pay a lot of attention to showing how powerful and easily implementable our theories are. This is what drove my group in the design of these toolboxes.

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

Giuseppe: My two children and wife take most of my time outside work. I do like coaching my children in their favorite sports: volleyball for my 11-year-old daughter and basketball for my six-year-old son. Of course, I am not an expert in these sports, but I pretend to be a coach, and I really enjoy playing with them. An activity that I used to practice—and I definitely miss—is swimming. I hope to be able to restart it since it allows me to concentrate and find inspiration. I do like mountains, so, whenever there is the opportunity, I take my family to the mountains (usually in the Dolomites) for some nice hiking. However, I admit that, since we were all born in the south of Italy, close to the sea, we really like to spend time during the summer on the beautiful coast of Salento in the south of Italy (where we lived for about 10 years).

Q. Thank you for your comments.

Giuseppe: You are welcome, and thanks for inviting me for this interview. I am honored to contribute to the IEEE Control Systems Society, not only with my scientific activity.

SERGIO GRAMMATICO

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

Sergio: I became very enthusiastic about control systems during my studies at the University of Pisa, Italy, from the first undergraduate course on automatic control. I even attended two courses on almost the same subject, one taught by Prof. Alberto Landi and one by Prof. Mario Innocenti. Later on, I had the opportunity

to start my first research steps under the supervision of distinguished professors in system theory and optimal control. At that early stage of my career, what fascinated me the most was how elegantly the field of automatic control exploits rigorous mathematics with an engineering mindset. I then decided to embark on a Ph.D. journey in Lyapunov stability and Lyapunov-based control.

I am very grateful to my lecturers and supervisors at the University of Pisa, Prof. Aldo Balestrino, Prof. Andrea Caiti, and Prof. Gabriele Pannocchia, among others, for providing

me with a solid background in system theory and automatic control. I am also particularly grateful to Prof. Franco Blanchini for our collaborations on my Ph.D. topics and for sharing his passion on Lyapunov control systems.

Afterwards, I moved to ETH Zurich as a postdoctoral researcher under the supervision of Prof. John Lygeros. Those years had a huge impact on my research interests. I started to appreciate even more research challenges on so-called systems of systems, and I became excited about game theory for multiagent systems (which is currently my main research area). Overall,

Sergio Grammatico with his wife, Liliana, and their son, Giorgio, in Delft, The Netherlands, 2019.

I am very passionate about Lyapunov stability theory and Lyapunov-based control for switching and switched linear systems.

Q. **What courses do you teach relating to control? Do you have a favorite course? How would you describe your teaching style?**

Sergio: I currently teach the courses "Systems and Control" (for undergraduates in electrical engineering), "Model Predictive Control" (for master's degree students in systems and control), and "Convex Optimization and Game Theory" (a Ph.D. course at the Dutch Institute of Systems and Control). Let me admit that I do not have a favorite one in the sense that I genuinely enjoy each of them in their respective education levels. "Systems and Control," the first course on feedback control for linear systems, truly inspired me as an undergraduate student. Thus, I hope to pass on and even amplify such an inspiration toward control systems to my undergraduate students. In the "Model Predictive Control" course, I find it very rewarding to see how much graduate students appreciate optimization-based control, both theoretically and computationally. Finally, in "Convex Optimization and Game Theory," I have a fantastic opportunity to introduce the mathematical beauty of convex optimization theory and some key notions in multiagent optimization to an audience of highly motivated Ph.D. students from all over The Netherlands.

As for my teaching style, I typically prefer to introduce concepts via

I believe that my education as a control system engineer and my early research collaborations shaped me as a critical thinker who appreciates simple and elegant solutions that are capable of overcoming relevant theoretical challenges.

Q. **What are some of your research interests?**

Sergio: My research interests lie at the intersection of systems and control theory, optimization, and game theory, especially for studying cooperation and competition in multiagent systems. I am particularly interested in analyzing and designing solution methodologies and algorithms for multiagent decision problems. In my research group, we have studied such decision problems in the context of clearing mechanisms in energy markets, economic power grid operation, and path planning for autonomous vehicles. From a system-theoretic perspective, I enjoy thinking of iterative solution algorithms as convergent dynamical systems. Furthermore,

Sergio Grammatico at the 2019 European Control Conference, Naples, Italy, with his son Giorgio, the youngest participant of the conference.

Profile of Sergio Grammatico

- *Current position*: associate professor, Delft University of Technology.
- *Contact information*: Delft Center for Systems and Control, TU Delft, Room C-3–350, Mekelweg 2, 2628CD, Delft, The Netherlands, s.grammatico@tudelft.nl, https://sites.google.com/site/grammaticosergio.
- *IEEE Control Systems Society (CSS) experience highlights*: IEEE Senior Member (2019); associate editor, IEEE CSS Conference editorial board (2018–2020); associate editor, *IEEE Transactions on Automatic Control* (2018–present).
- *Notable awards*: Roberto Tempo Award (2021).

examples and open discussions with the students, thus directly involving them in developing ideas and possible remedies to the considered technical challenges. After the key ideas are discussed and become more clear, I then proceed with more formal definitions and mathematical derivations. Another feature of my teaching style is that I tend to be well structured in my classes.

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

Sergio: I think that system theory and automatic control nowadays represent a mature scientific area that still has huge potential for driving several high-tech applications in engineering, health care, and mathematical economics to the next level. Among other domains, I find system-theoretic and control ideas fundamental for renewable energy generation and integration into our power grids and for enhancing vehicle intelligence and autonomy. Control developments in these areas will be essential to achieve sustainable energy systems and transportation systems, even though I would expect these developments to remain a hidden enabling technology. Control system

Sergio Grammatico and his group members enjoying the beach in Hook van Holland, September 2021: (from left) Sergio Grammatico, Suad Krilasevic, Mattia Bianchi, Barbara Franci, Wicak Ananduta, and Emilio Benenati).

engineers are in a unique position to work on modeling, control, planning, and optimization in complex systems.

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

Sergio: I like traveling, especially to places on the sea, and spending time with my family. Our son is currently three years old, and both my wife and I enjoy playing with him a lot—among other activities, we regularly attend soccer lessons—and walking in nature. In the very little free time left, I enjoy playing chess.

Q. **Thank you for your comments.**

Sergio: Absolutely! Thank you very much for this opportunity.

NECMIYE OZAY

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

Necmiye: I was always interested in mathematics and engineering from an early age. I ended up studying electrical and electronics engineering in college (at Bogazici University) since it seemed like an engineering field that emphasizes mathematical rigor. I got involved in undergraduate research in robotics in my sophomore year, where I was exposed to feedback control for the first time. Also, all of my favorite

Necmiye Ozay field-testing a correct-by-construction adaptive cruise control algorithm on an autonomous car in Mcity (the University of Michigan's autonomous vehicle testing facility) with Ph.D. students Kwesi Rutledge (right) and Petter Nilsson (left).