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Nanotechnology: from sensors to systems

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Abstract: Nanotechnology is revolutionizing control systems by integrating advanced materials and miniaturized sensors with sophisticated electrical applications, leading to enhanced precision and efficiency. The development of novel nanomaterials, such as carbon nanotubes, graphene, and quantum dots, has opened new possibilities for creating highly sensitive sensors and actuators that play a crucial role in real-time control systems. These materials not only improve the performance of nanoscale sensors but also enable faster, more energy-efficient control responses in applications ranging from robotics and automation to smart grids and electronic devices. Furthermore, the electrical properties of these materials allow for the development of low-power, high-performance control systems capable of handling complex tasks in demanding environments. As nanotechnology continues to evolve, it holds immense potential for advancing the next generation of intelligent, adaptive control systems, fostering innovation across industries such as manufacturing, energy, and healthcare. The integration of nanotechnology into control systems is a major driver of innovation across multiple sectors, including energy, robotics, manufacturing, and electronics. From advanced sensors used in environmental monitoring and medical diagnostics to the design of nanoscale systems for computing, energy, and materials science, nanotechnology holds immense potential.



Bio: Patrizia Lamberti (SM'21) Master degree in Electronic Engineering and Ph.D. in Information Engineering from the University of Salerno, in 2001 and 2006, respectively. She is Associate Professor of Electrical Engineering with the Department of Information and Electrical Engineering and Applied Mathematics (DIEM), University of Salerno, Italy. Since 2002, she has been involved in experimental and numerical research on device, nano-materials and innovative composites for electrical engineering applications in several fields, with emphasis on Robust Design in presence of uncertainty. She is the vice-dean of the interdepartmental center NANO_MATES (Research Centre for NANOMaterials and nanoTEchnology at University of Salerno) on nanotechnology of the University of Salerno and the scientific representative for the University of Salerno at ICeMB- national inter-university research Centre on the Interaction between electromagnetic fields and Biosystems. She has more than ten years of experience in writing, conducting and evaluating national and international research projects. She has been project leader for the University of Salerno unit in more than 10 European projects (FP7, H2020) on electrical application of nanotechnology, including the ten-year partnership project Graphene Flagship, and has been responsible or member of about 20 national projects. She is currently the contact person for the University of Salerno for two European projects (H2020 and HORIZON Europe) and two projects of national relevance (PRIN2022 and PRIN2022-PNNR).

She has authored over 140 scientific publications in international journals and in proceedings of international conferences. She currently serves IEEE as chair of the IEEE Italy Women in Engineering Affinity Group Italy Section and as vice-chair of the IEEE Nanotechnology Council Italy Chapter.