UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

PHD PROGRAM IN
INFORMATION AND TECHNOLOGY FOR HEALTH

PHD PROGRAM IN INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

Seminar announcement

Thursday 25 June 2026, Time: 11:00 - 13:00
Room I2, Floor 1, Building 3, DIETI - Via Claudio, 21 - NAPOLI

Dr. G. Lloyds Raja

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Advanced Control Schemes for Multivariable Engineering Processes: Recent Trends, Applications, and Challenges

Abstract: When industrial processes involve large communication delays, strong disturbances or unstable dynamics, conventional unity-feedback structures often fail to provide acceptable performance. This lecture briefly introduces advanced yet practically implementable control schemes like Smith predictor, cascade control and dual-loop ones. Also, Smith predictor–based compensation strategies (for load frequency control in modern power systems with communication delay), cascade and dual-loop control architectures (for chemical processes, biomedical neonatal suction device with dual-sensor and DC-DC boost converters), and PI design for multi-output converters are provided. The influence of model mismatches, uncertainties, and delays on closed-loop behavior is presented. Practical tuning guidelines are discussed from an implementation perspective.

Lecturer short bio: Dr. G. Lloyds Raja is Assistant Professor (Grade-I) in Electrical Engineering at the National Institute of Technology Patna, India. He earned his Ph.D. from Indian Institute of Technology Patna and was a Postdoctoral Research Fellow at Shanghai Jiao Tong University. His research focuses on model-based control of processes with time-delay of integrating and unstable type, with applications in biomedical, power electronics, and modern power systems. He has authored over 50 peer-reviewed journal articles in leading international journals, including IEEE Transactions, ISA Transactions, Applied Energy, and Chemical Engineering Science. He is a Co-Editor of three books related to industrial controllers and is listed among Stanford University's Top 2% Scientists (2024 and 2025). He has successfully supervised many doctoral dissertations and multiple students at graduate/post-graduate level. Dr. Raja is also an inventor with multiple granted patents in control systems, biomedical devices, and cyber-resilient frequency regulation in power systems.

For information: Prof. Laura Celentano – laura.celentano@unina.it *(organizer)*