



The
University
Of
Sheffield.

Automatic
Control and
Systems
Engineering

The Department of Automatic Control & Systems Engineering
is pleased to announce the following seminar:

Optimal control in Smartgrids, towards droop-free methods

Dr Pablo R Balddivieso Monasterios

Department of Automatic Control and Systems Engineering, The University of Sheffield

Wednesday, 21 October 2020 at 14:00

Via Google Meet

Host Academic: Dr George Konstantopoulos, ACSE

Abstract

Power systems have traditionally used droop control methods for both voltage support and as a tool to enforce load sharing among the various generators. Despite a relative success in implementation, these type of controllers present drawbacks in terms of performance and slow response to system variations. This talk will outline recent work on droop-free methods for systems comprising renewable energy sources subject to constraints. The system in consideration consists of an heterogeneous array of components, for example wind turbine generator, battery storage and local loads together with their power conversion units connected to a weak grid. The approach has the potential to overcome the limitations in performance imposed by droop controllers, namely its slow response to response to variations in the network and its power sharing capabilities. The approach consists on a two-layer controller which ensures both boundedness of the currents injected by each energy source and optimal power management operation of the entire microgrid. We will explore the extension of the proposed optimal controller to the islanded case.

Biography

Pablo R Balddivieso received a MSc in Control Systems and a PhD in Distributed Control at the University of Sheffield in 2014 and 2018 respectively. He is currently part of the Control and Power System research group in ACSE, working as a postdoctoral research associate. His research interests are nonlinear optimal control, networked systems, smartgrids, and electricity markets.