

Research theme title:

Advanced control strategies with applications to sustainable bioprocesses

Description:

The research activity deals with the development of advanced process control methodologies (for example, Model Predictive Control, fractional control, event-based control, etc.), in the framework of the activities of the Industrial Control Systems research group of the University of Brescia. In particular, the application of advanced methodologies to bioprocesses (namely, raceway bioreactors for the production of microalgae) will be considered thanks to the cooperation with the University of Almeria (Spain) where such a plants are available for experimentation.

Related Works:

E. Miranda Rodriguez, J. L. Guzman, M. Berenguel, F. G. Acien, A. Visioli, “Diurnal and nocturnal pH control in microalgae raceway reactors by combining classical and event-based control approaches”, *Water Science and Technology*, Vol. 82, pp. 1155-1165, 2020.

E. Miranda Rodriguez, F. G. Acien, J. L. Guzman, M. Berenguel, A. Visioli, “A new model to analyze the temperature effect on the microalgae performance at large scale raceway reactors”, *Biotechnology & Bioengineering*, Vol. 118, pp. 877-889. 2021.

E. Miranda Rodriguez, J. L. Guzman, F. G. Acien, M. Berenguel, A. Visioli, “Indirect regulation of temperature in raceway reactors by optimal management of culture depth”, *Biotechnology & Bioengineering*, Vol. 118, pp. 1186-1198, 2021.

Hosting University:

University of Brescia, Italy

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Type of scholarship:

DM 118/2023 – Project on PNRR (Italy's Recovery and Resilience Plan)