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Expertise

Luigi Frunzo is Assistant Professor in Applied Mathematics at University of Naples “Federico II”. He received his PhD degree in Hydraulic, Transportation and Territorial Systems Engineering. He defended his PhD thesis Entitled “*Mathematical modelling of anaerobic suspended and attached growth bioreactors*”.
His main expertise is related to the development of mathematical methods and models for applied sciences. In particular his research is focused on the development of mathematical models for complex biological systems (i.e. Anaerobic digestion, Sulfate reducing, autotrophic and heterotrophic nitrogen removal) and multi-species biofilms, including the qualitative analysis of the relevant equations, quantitative analysis, numerical simulation and validation of the models obtained.

Key papers related to the COST action

1. G. ESPOSITO, **L. FRUNZO**, A. PANICO and G. d'ANTONIO (2008). Mathematical modelling of disintegration-limited co-digestion of OFMSW and sewage sludge. Water Sci. Technol. vol. 58(7) pp. 1513-1519.
2. B. D’ACUNTO, **L. FRUNZO** (2011). Qualitative analysis and simulations of a free boundary problem for multispecies biofilm models. Math. Comput. Modelling 53(9-10) pp. 1596–1606.
3. G. ESPOSITO, **L. FRUNZO**, A. PANICO and F. PIROZZI (2011). Modelling the effect of the OLR and OFMSW particle size on the performances of an anaerobic co-digestion reactor. Process Biochem. 46(2) pp.557-565.
4. B. D’ACUNTO, G. ESPOSITO, **L. FRUNZO**, F. PIROZZI. (2011) Dynamic modeling of sulfate reducing biofilms. Comput. Math. Appl. 62(6) pp.2601-2608.
5. B. D’ACUNTO, **L. FRUNZO** (2012). Free boundary problem for an initial cell layer in multispecies biofilm formation. Appl. Math. Lett. 25(1) pp20-26.
6. G. ESPOSITO, **L. FRUNZO**, A. PANICO and F. PIROZZI (2011). Model calibration and validation for OFMSW and sewage sludge co-digestion reactors. Waste Manage. 31(12) pp. 2527-2535
7. G. ESPOSITO, **L. FRUNZO**, LIOTTA, F., A. PANICO and F. PIROZZI (2012). Bio-methane potential tests to measure the biogas production from the digestion and co-digestion of complex organic substrates. The Open Environmental Engineering Journal 5 pp 1–8.
8. G. ESPOSITO**, L. FRUNZO**, GIORDANO, A., LIOTTA, F., A. PANICO and F. PIROZZI (2012). Anaerobic co-digestion of organic wastes. Rev Environ Sci Biotechnol 11(4) pp 325-341.
9. G. ESPOSITO, **L. FRUNZO**, A. PANICO and F. PIROZZI (2012). Enhanced bio-methane production from co-digestion of different organic wastes. Env Technol 33(24) pp 2733-2740.
10. G. ESPOSITO, **L. FRUNZO**, PIROZZI F., and P. LENS (2012) Dynamic mathematical modelling of sulfate reducing gas-lift reactors. Process Biochem. 47(12) pp2172–2181.
11. B. D’ACUNTO, G. ESPOSITO, **L. FRUNZO**, M.R. MATTEI, F. PIROZZI (2013). Analysis and simulations of the initial phase in multispecies biofilm formation. Communications in Applied and Industrial Mathematics. 4 pp 1-23.
12. F. LIOTTA, G. d’ANTONIO, G. ESPOSITO, M. FABBRICINO, **L. FRUNZO**, E. D. VAN HULLEBUSCH, P. N.L. LENS, F. PIROZZI (2013). Moisture effect on disintegration kinetics of anaerobic digestion of complex organic substrates. Waste Management & Research.