Alejandro Vignoni

Research Scholar – PhD Student
Control Systems Engineering
Synthetic & System Biology

Alejandro Vignoni
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EDUCATION

2009-	Ph.D. in Control Engineering, Robotics and Industrial Informatics Universidad Politécnica de Valencia
2009-2011	M.Sc. in Control Engineering and Industrial Informatics Universidad Politécnica de Valencia
2003-2008	B.Eng. in Electronics and Control Systems Universidad Nacional de La Plata

ACADEMIC POSITIONS HELD

2011-	Research Scholar at Instituto Universitario de Automática e Informática Industrial (AI2), Universidad Politécnica de Valencia, Spain.
2009-2011	PhD Student at Instituto Universitario de Automática e Informática Industrial (AI2), Universidad Politécnica de Valencia, Spain.
2011 (3 months)	Visiting Researcher at Centre for Synthetic Biology and Innovation, Department of Bioengineering, Imperial College London, UK. Advisor: Dr. Guy-Bart Stan.
2008 (10 months)	Visiting Researcher at Fermi National Accelerator Laboratory (FNAL). Batavia, IL. Advisor: Dr. Gustavo Cancelo.

PRIZES AND FELLOWSHIPS

Fellowships	Doctoral fellowship «Formación Personal de Investigación», Universidad Politécnica de Valencia (2009-2013).
Prize	EECI Graduate School on Control 2012 Award. Scholarship to attend to one of the modules (2012).
Prize	IEEE Control System Society Technical Committee on VSS: PhD student scholarships to attend to the 12th International Workshop on Variable Structure Systems, Mumbai (2012).
Prize	Gold Medal - *International Genetically Engineered Machine Competition (iGEM)*, as member of the IGEM Valencia Team 2010. MIT, Cambridge, MA, USA (2010).

Prize Valedictorian award or «Premio de Excelencia»
Award to most outstanding graduates. Concejo Deliberante de la Municipalidad de La Plata (2009).

Prize Valedictorian award or «Premio de Excelencia»
Award to the top graduate of the class. Electronic Engineering, Universidad Nacional de La Plata (2009).

RESEARCH INTERESTS

Synthetic and systems biology // nonlinear and complex systems // biosystems modeling // coordination, consensus and synchronization // dynamical systems networks // sliding modes // hybrid systems // biotechnology processes monitoring and control.

PUBLICATIONS — *Journals*

1. De Battista H, Picó J, Garelli F, Vignoni A (2011). Specific growth rate estimation in (fed-)batch bioreactors using second-order sliding observers, J. Process Control, doi:10.1016/j.jprocont.2011.05.008

PUBLICATIONS — *Conferences (oral, papers & posters)*

2. Vignoni A, Stan G-B, Oyarzún D A, Picó J (2012). Population-level control of heterologous protein production in bacteria. *EFB Applied Synthetic Biology in Europe, Barcelona.*
3. Vignoni A, Picó J, Garelli F, De Battista H (2012). Sliding mode reference conditioning for coordination in swarms of non-identical multi-agent systems. *12th IEEE International Workshop on Variable Structure Systems. Mumbai.*
4. Vignoni A, Picó J, Garelli F, De Battista H (2011). Dynamical Systems Coordination via Sliding Mode Reference Conditioning. *IFAC World Congress. Milan.*
5. De Battista H, Picó J, Garelli F, Vignoni A (2010). Specific Growth Rate Estimation in Bioreactors Using Second-Order Sliding Observers. *IFAC International Conference Computer Applications in Biotechnology*. Leuven.
6. Cancelo G, Vignoni A (2008). Optimizing cavity gradients in pulsed linacs using the cavity transient response. International Linear Accelerator Conference (LINAC08). Victoria
7. Cancelo C, Armiento C, Treptow K, Vignoni A, Zmuda T (2008). Real Time RF Simulator (RTS) and Control. International Linear Accelerator Conference (LINAC08). Victoria.

TEACHING

2012 Graduate Teaching Assistant. Mobile Robotics, Control and Systems Engineering Department, Universidad Politécnica de Valencia, Spain. (42 hours).

2011 Graduate Teaching Assistant. Modelling in Biology, Department of Bioengineering, Imperial College London, UK (42 hours).

2009 Graduate Teaching Assistant. Pre-university course «*Curso de Ingreso*», EE Dept. FI–UNLP, Argentina. (80 hours).

2007-2009 Graduate Teaching Assistant. Mathematics A. EE Dept. FI–UNLP, Argentina. (96 hours).
Graduate Teaching Assistant. Electric Circuits Theory II. EE Dept. FI–UNLP, Argentina. (96 hours).

2006-2007 Teaching Assistant. Electric Circuits Theory II. EE Dept. FI–UNLP, Argentina. (96 hours).

RESEARCH PROJECTS

2011-2014 Multi-scale inference, monitoring, optimization and control: from engineered cells to bioreactors. (MultiScaleS) Spanish Ministry of Science and Technology (FEDER-CICYT DPI2011-28112-C04-01).
Value: 198.000 €

2009-2012 *Multi-scale modeling in systems biology. Application to monitoring, optimization and control of bioprocesses*. Spanish Ministry of Science and Technology (FEDER-CICYT DPI2008-06880-C03-01).
Value: 256.048 €

2010-2011 *Differential algebra applications to biological processes modeling and control. Universidad Politécnica de Valencia* (UPV-2606).
Value: 7.500 €

2009-2010 *Automatic Control of multisubstrate bioprocesses* (BIOCONTROL). Spanish Ministry of External Affairs (A/016560/08-A/024186/09).
Value: 32.250 €

COURSES

«On Discontinuous Observers: From Basic Properties to a Robust Fault Detection and Condition Monitoring Tool», Prof. Sarah Spurgeon (U. of Kent). IEEE Webinar, University of Kent, UK (2012).

«Open stochastic systems», Prof. Jan Willems (KU Leuven). CAS Seminar, Imperial College, London, UK (2011).

«Stochastic Dissipative Systems», Prof. Sanjoy Mitter (MIT). CAS Seminar, Imperial College, London, UK (2011).

«Glycolytic oscillations and cicle limits on robust efficiency», Prof. John Doyle (Caltech). Seminar, Imperial College, London, UK (2011).

«Autumn Symposium on Systems and Synthetic Biology», Institute of Systems and Synthetic Biology, Imperial College London, UK (2011).

«4th HYCON2 PhD School on Control of Networked and Large-Scale Systems», Organizers: Prof. Alberto Bemporad and Prof. Maurice Hemeels. Univeristy of Trento, Italy(2011).

«Controlled Synchronization of Dynamical Systems», Dr. Antonio Loría, HYCON-EECI Graduate School on Control, LSS, SUPELEC(2011).

«Hybrid systems: Theory, computation and applications», Prof. John Lygeros (ETH Zurich). Universidad Politécnica de Valencia (2010).

«Brain computer interfaces», Prof. Javier Minguez (Universidad de Zaragoza). Universidad Politécnica de Valencia (2010).

«Sliding modes in MIMO systems», Dr. Fabricio Garelli (Universidad Nacional de La Plata). Universidad Politécnica de Valencia (2010).

«Discrete event systems», Prof. Manuel Silva (Universidad de Zaragoza). Universidad Politécnica de Valencia (2010).

«Set Membership Estimation: Theory and Applications», Dr. Marco Casini (Università di Siena). Universidad Politécnica de Valencia (2010).

«System biology national course», *Red Española de Biología de Sistemas*, Murcia, (2009).

School «Blas Cabrera» of introduction to Research, Teaching and Innovaiton. Universidad Internacional Menéndez Pelayo, Santander. Full scholarship of the Spanish Ministry of Education(2009).

«LMI, optimization and polynomial methods», Dr. Didier Henrion (LAAS-CNRS Toulouse). *Universidad Politécnica de Valencia*, (2009).

«Advanced Robotics and Control», Prof. Andes Robertsson (Lund University). *Universidad Politécnica de Valencia*, (2009)

«Sliding Mode control systems», Dr. Mantz, *Universidad Nacional de La Plata* (2009).

«Linear Systems», Dr. De Battista, *Universidad Nacional de La Plata* (2008).

LANGUAGES

Spanish	Mother tongue.
English	Fluent.
Italian	Fluent.
Catalan	Beginner.

HOBBIES

Sports	Swimming, mountain biking, climbing, hiking/trekking, yoga.
Music/Arts	Playing classical guitar (semi-professional level).
	Taking pictures/Photography.
Travel	Around the world.