



Sylvain LEIRENS

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Born on: December 1. 1972

French nationality

Visiting Professor in Electrical Engineering Ph.D. of Ecole Supérieure d'Electricité-University of Rennes I Electrical Engineer of the Ecole Supérieure d'Electricité

EDUCATION

- 2005** **PhD thesis** "Hybrid approach for voltage predictive control of electric power networks"
Supélec - University of Rennes I (France)
- 2002** **DEA STIR** (one-year university degree in advanced control and signal processing)
University of Rennes I (France)
- 2002** **Electrical Engineer's degree**
Ecole Supérieure d'Electricité (named Supélec, France)
Specialization in control engineering
- 1999** **DEUG SSM** (two-year university degree, majors: mathematics and physics)
University Claude Bernard of Lyon (France)
- 1991** **Baccalauréat série C** (majors: mathematics and physics)
High School Langevin Wallon of Champigny Sur Marne (France)

SKILLS

Control Engineering

Model Predictive Control (MPC), multivariable control, modelling using bond graphs, Matlab-Simulink programming, Modelica language, Differential Algebraic Equation (DAE) systems, hybrid system modelling and control, piece wise affine (PWA) systems, real time systems (VxWorks), Schneider Telemecanique OPCs TSX Premium series, mixed optimization

Power Systems

Power system modelling (static and dynamic models, hybrid), voltage instability phenomena, predictive control of transmission grids, machines (DC, synchronous, induction motors), power electronics (converters), transformers, load modelling, circuit theory

Software

Matlab-Simulink, Java, C, Pascal, Modelica (object oriented and acausal modelling), Dymola (dynamic modelling laboratory), Mathematica (symbolic calculus), CPLEX, AMPL, dSpace, LabView

Teaching

Licence and Master level in electrical engineering: dynamical system modelling, advanced control, optimization, power systems and electronics; student project supervisor

FOREIGN LANGUAGES

- French** Native language
English Professional communication skills
Spanish Fluently
German Studied for 4 years but not used

EMPLOYMENT

- From 02/2008** **Visiting Professor**, Departamento. de Ingeniería Eléctrica y Electrónica
Universidad de Los Andes, Bogotá (Colombia)
Field of research:
- Modelling and control of dynamical systems
Teaching:
- Modelling and Analysis of dynamical systems
- Control system analysis
- 02/2007-01/2008** **Associate Professor**, Facultad Ingeniería de Diseño y Automatización Electrónica
Universidad de La Salle, Bogotá (Colombia)
Field of research:
- Dynamical systems optimization, application to biological systems
- Research coordinator of the faculty
- Junior researcher group supervisor
Teaching:
- 5th semester courses, lectures and labwork in dynamical system modelling
- 7th semester courses, lectures and labwork in discrete time control
- 9th semester lectures in constrained predictive control
- 09/2002-01/2007** **Assistant Professor** in electrical engineering
Supélec - Rennes campus (France)
Field of research:
- Constrained optimization of complex dynamical systems
- Application to voltage control of electric power networks
Teaching:
- 3rd year (Master) courses, lectures and labwork in process control
- 1st and 2nd year (License) lectures and labwork in power systems
- 2002** **Internship:** "Development of a prototype for the implementation of identification and control methods" (4 months)
Research Centre of Voreppe (Grenoble, France) - Pechiney Group
- 2001** **Internship:** "Formal modelling of switching systems using bond graph" (2 months)
Hybrid System Control Group - Supélec (Rennes, France)

LAST SCIENTIFIC PUBLICATIONS

Conference papers

S. Leirens, J. Buisson, "An efficient algorithm for predictive control of piecewise affine systems with mixed inputs", in the proceedings of the 2nd IFAC Conference on Analysis and Design of Hybrid Systems (ADHS), Alghero, Sardinia, 2006

R.R. Negenborn, A.G. Beccuti, T. Demiray, S. Leirens, G. Damm, B. De Schutter, M. Morari, "Supervisory hybrid model predictive control for voltage stability of power networks", in the proceedings of the American Control Conference, New York, pp. 5444-5449, 2007

Book chapter

S. Leirens, J. Buisson, chapter "La commande prédictive hybride" in "La commande prédictive : Avancées et perspectives" by P. Boucher, D. Dumur editors, Traité IC2, série Systèmes automatisés, Hermès Science Publications, 2006, ISBN 2-7462-1361-3

Thesis

S. Leirens, "Hybrid approach for voltage predictive control of electric power networks", PhD thesis, Supélec - University of Rennes I (France), 174 pages, december 2005

ACTIVITIES AND INTERESTS

- Sports** Swimming, deep diving (instructor), trekking (mountains, deserts)
Hobbies Music (guitar), astronomy, travels, reading