CURRICULUM VITAE

Gabriela Hug-Glanzmann

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Education

05/04 – 04/08: **PhD in Electrical Engineering**
Power Systems Laboratory, ETH Zurich, Switzerland
Thesis: "Coordinated Power Flow Control to Enhance Steady-State Security in Power Systems"
Advisor: Prof. Goeran Andersson; Co-Advisors: Prof. Antonio Conejo, Prof. Manfred Morari

10/04 – 04/07: **Degree in Higher Education (Teaching)**
ETH Zurich, Switzerland

10/99 – 04/04: **M.Sc. in Electrical Engineering and Information Technology**
ETH Zurich, Switzerland
Thesis: "Supervisory water level control for cascaded river power plants"
Advisor: Prof. Manfred Morari

Professional Experience

08/11 – present **Affiliated Faculty**
Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, USA

07/09 – present **Assistant Professor**
Electrical and Computer Engineering Department, Carnegie Mellon University, Pittsburgh, USA

- Research: FACTS devices as enabler of wind generation integration, microgrid management, distributed predictive control for large-scale systems, coordination of intermittent generation with storage devices, optimal control for hydro power plants
- Teaching: graduate course in power systems

05/08 – 05/09 **Assistant Network Management Engineer**
Special Studies Group, Hydro One, Toronto, Canada

- Project Work: Overvoltage studies due to line breaker reclosure, simulations for Dynamic Transformer Rating, investigations on noise mitigation options for transformer cooling fans, investigations on electronic home equipment damage due to lightning strike in microwave tower, literature search on health effects of wind turbines,

probabilistic assessment of relay failures and implications on required workforce
- Teaching: Organization of Power System Fundamentals course, preparing and grading of quizzes and part-time teaching

06/04 – 04/08 **Scientific Assistant**
Power Systems Laboratory, ETH Zurich, Switzerland
- Research: Development of a control scheme for the coordination of FACTS devices in power systems, implementation of control scheme in MATLAB
- Teaching: Writing lecture scripts, coordinating and giving exercise lessons, supervising student projects, formulating exam questions and grading exams

09/06 – 10/06 **Visiting Scholar**
Delft Centre of Systems and Control, TU Delft, The Netherlands
- Research: multi-area control in power systems

Teaching Experience

- **Carnegie Mellon University, Department of Electrical and Computer Engineering**
  - Fall 2011 — Assistant Professor
    Teaching "Optimization in Energy Networks" (graduate)
  - Spring 2011 — Assistant Professor
    Taught "Fundamentals in Electric Energy Systems" (undergraduate)
  - Fall 2009 — Assistant Professor
    Taught "Optimization in Energy Networks" (graduate)
- **Hydro One, Special Studies Group**
  - Fall 2008/Spring 2009 — Teaching Assistant
    Coordinated and partly taught "Electric Power Systems" for newly hired employees
- **Zurich University of Applied Sciences**
  - Winter 2005/2006 — Practical Training for Teaching degree
    Taught "Signals and Systems I"
- **ETH Zurich, Department of Electrical Engineering and Information Technology**
  - Winter 2007/2008, Winter 2006/2007
    Teaching Assistant, Power Systems Laboratory
    Coordinated recitation classes "Electric Circuits I" (undergrad.)
  - Winter 2006/2007 — Teaching Assistant, Power Systems Laboratory
    Supervised Semester thesis project
  - Winter 2004/2005, Summer 2005, Winter 2005/2006, Summer 2006
    Teaching Assistant, Power Systems Laboratory
    Supervised undergraduate student projects
  - Winter 2004/2005, Winter 2005/2006
    Teaching Assistant, Power Systems Laboratory
    Taught recitation class "Electric Circuits I" (undergraduate)

- Winter 2005/2006 — Teaching Assistant, Power Systems Laboratory
  Supervised Master thesis project
- Summer 2003 — Teaching Assistant, Control Laboratory
  Updated lecture notes for "Signals and Systems II" (undergrad.)
- Summer 2002, Summer 2003
  Teaching Assistant, Electrical Engineering Development
  Taught recitation class "Electrical Engineering" (undergraduate)
- Summer 2002 — Teaching Assistant, Control Laboratory
  Wrote instructions for laboratory exercises
- Winter 2001/2002, Winter 2002/2003
  Teaching Assistant, Control Laboratory
  Supervised undergraduate student projects
- Winter 2000/2001 — Teaching Assistant, Electronics Laboratory
  Taught recitation class "Digital Technology" (undergraduate)

Awards and Honors

- Wimmer Faculty Grant 2010
- ABB Research Award 2008
- 2nd place ETG-Innovation-Award 2008
- ETG-Innovation-Award 2005
- ETH medal 2004
- 2nd place Award for young researchers of the journal "Technische Rundschau" 2004
- DaimlerChrysler Scholarship 2001 – 2003

Patents

"System for Controlling Hydroelectric Power Plants"
Patent-No.: 05773319.8-2206-CH2005000505
Authors: Gabriela Glanzmann, Martin von Siebenthal, George Papafotiou,
Tobias Geyer, Manfred Morari of ETH Zurich

Professional Activities

Committees

- ECE Graduate Seminar Organizing Committee, Carnegie Mellon University, 2009 – present
- Faculty Search Committee, Energy Infrastructure Systems, Civil and Environmental Engineering Department, Carnegie Mellon University, 2010

Reviewing Activities

- IEEE Transactions on Power Systems
- IEEE Transactions on Control Systems Technology
- IET Generation, Transmission and Distribution
- Proceedings of the IEEE
- American Control Conference 2012
- Conference on Decision and Control and European Control Conference 2011
- Power Systems Computation Conference (PSCC) 2011
- Power Systems Conference and Exhibition (PSCE) 2011
- PowerTech Conference 2007

Technical Societies

- Member of Power Engineering Society (since 2009)
- Member, Institute of Electrical and Electronics Engineers (since 2005)
- Member of IEEE Women in Engineering (since 2005)

Research Groups

- Co-Director, Electric Energy Systems Group, Carnegie Mellon University (2010 – present)
- Thrust Leader CMU Smart Grid Center (2010 – present)
- Member, Power Systems Engineering Research Center (PSERC) (2009 – present)
- Member, Carnegie Mellon Electricity Industry Center (CEIC) (2009 – present)
- Member, HYCON, Network of Excellence of European Universities in Hybrid Control (2005 – 2008)

Conference Committees, Boards, Working Groups and Panel Reviews

- Participant IEEE Smart Grid Vision Project for Control Systems
- NSF Panel Reviewer (2010 – present)
- Session Chair CMU Electricity Conference, 2010 and 2011

Supervised Students

PhD Students

- Rui Yang (August 2009 – present)
- Dinghuan Zhu (August 2009 – present)
- Kyri Baker (August 2010 – present) (main advisor; co-advisor: Xin Li)
- Todd Ryan (November 2010 – present) (co-advisor; main advisor: Paulina Jaramillo)
- Hameed Safiullah (August 2011 – present) (co-advisor; co-advisor: Rahul Tongia)

Master Students

- Zhe Yu (Semester project, Spring 2010; Summer Project 2010)
- Christopher Peplin (Development project, April 2010 – December 2010)
- Lukas Wehinger (Visiting Student ETH Zurich, MSc project, April 2010 – October 2010)
- Ruvini Kankanamalage (Visiting MSc Student, Summer project, Summer 2010)
- Harald Franchetti (Visiting Student TU Vienna, MSc project, January 2011 – August 2011)
- Deepak Viswanath (Semester project, Spring 2011)

Undergraduate Students

- Liang Tang (Semester project, Spring 2011; Semester Project, Fall 2011)
- Ee Kent Lew (Semester project, Spring 2011)
- Mark Lim (Semester Project, Fall 2011)
- Aakriti Gupta (Semester Project, Fall 2011)

PhD Committee Member

- Ellery Blood (2009)
- Juhua Liu (2010)
- Kyle Anderson (2011)
- Sumit Mitra (2011)

Awarded Grants and Contracts

- "Control Algorithms for the Optimal Usage and System Integration of Sodium-Ion Batteries," (PI, Co-PI: Jay Whitacre), Innovation Works, 01/2011 – 08/2011, $85,000
- "Designing SCADA Systems for the Self-Verifiability of Their Security & Survivability," (Co-PI, PI: Joseph Giampapa), Department of Energy, 01/2011 – 08/2012, $250,000
- "Planning, Management and Control in Large-Scale Systems: Enabling the Integration of Intermittent Energy Sources," (PI, Co-PI: Xin Li), National Science Foundation, 09/2010 – 09/2013, $346,215
- "Tools and techniques for considering transmission corridor options to accommodate large scale renewable energy resources," (Co-PI, PI: Vijay Vittal), Power Systems Engineering Research Center, 07/2010 – 06/2012, $190,000 (CMU: $60,000)
- "New Course: Fundamentals in Electric Energy Systems," Wimmer Faculty Grant, 04/2010 – 04/2011, $2800
- "Smart Microgrid Management," (PI), Lockheed Martin, 12/2009 – 07/2010, $100,000

Publications

Book Chapters

[BC1] R.R. Negenborn, G. Hug-Glanzmann, B. De Schutter, G. Andersson, "A Novel Coordination Strategy for Multi-Agent Control Using Overlapping Subnetworks with Application to Power Systems" in Javad Mohammadpur, Karolos M. Grigoriadis, "Efficient Modeling and Control of Large-Scale Systems," Springer, 2010

Journal Papers

[J5] L. Wehinger, G. Hug, M. D. Galus, G. Andersson, "Modeling Electricity Wholesale Markets with Model Predictive and Profit Maximizing Agents," *submitted to IEEE Transactions on Power Systems*, October 2011

[J4] G. Hug, J.A. Giampapa, "Vulnerability Assessment of AC State Estimation with Respect to Data Injection Cyber-Attacks," *submitted to IEEE Transactions on Smart Grid*, August 2011

[J3] G. Hug-Glanzmann, G. Andersson, "N-1 Security in Optimal Power Flow Control Applied to Limited Areas", *IET Generation, Transmission and Distribution*, 2009, Vol. 3, Iss. 2, pp. 206 - 215

[J2] G. Hug-Glanzmann, G. Andersson, "Decentralized Optimal Power Flow Control for Overlapping Areas in Power Systems", *IEEE Transactions on Power Systems*, Vol. 24, No.1, February 2009, pp 327 - 336

[J1] R. Sachs, G. Glanzmann, M. von Siebenthal, "Automatische Stauziel- und Durchflussregulierung einer Flussstaukette," Bulletin SEV/AES, No. 15/05, 2005

Conference Papers

[C15] R. Kankanamalage, G. Hug-Glanzmann, "Transmission Capacity Enhancement by Optimal Usage of Storage Devices," *PES General Meeting*, Detroit, USA, 2011

[C14] G. Hug-Glanzmann, "Model Predictive Control for the Coordination of Wind and Hydro Power," *PES General Meeting*, Detroit, USA, 2011

[C13] D. Zhu, G. Hug-Glanzmann, "Real-Time Control of Energy Storage Devices in Future Electric Power Systems," *PowerTech Conference*, Trondheim, Norway, 2011

[C12] G. Hug-Glanzmann, "A Hybrid Approach to Balance the Variability and Intermittency of Renewable Generation," *PowerTech Conference*, Trondheim, Norway, 2011

[C11] L. Wehinger, G. Hug-Glanzmann, M. Galus, G. Andersson, "Assessing the Effect of Storage Devices and a PHEV Cluster on German Spot Prices by Using Model Predictive and Profit Maximizing Agents," *Power Systems Computation Conference*, Stockholm, Sweden, 2011

[C10] D. Zhu, R. Yang, G. Hug-Glanzmann, "Managing Microgrids with Intermittent Resources: A Two-Layer Multi-Step Optimal Control Approach," *North American Power Symposium*, Arlington, Texas, USA, 2010

[C9] G. Hug-Glanzmann, "Coordination of Intermittent Generation with Storage, Demand Control and Backup Generation," *iREP Symposium - Bulk Power Systems Dynamics and Control*, Armação de Búzios, Brazil, 2010.

[C8] G. Hug-Glanzmann and G. Andersson, "An Accurate and Efficient Current Injection Method for the Determination of the System State during Line Outages," *16th Power Systems Computation Conference*, Glasgow, Scotland, 2008

[C7] G. Hug-Glanzmann and G. Andersson, "Coordinated control of FACTS devices in power systems for security enhancement," *in Proceedings of the iREP Symposium - Bulk Power Systems Dynamics and Control*, Charleston, USA, 2007.

[C6] G. Hug-Glanzmann , R. Negenborn, G. Andersson, B. De Schutter, H. Hellendoorn, „Multi-area control of overlapping areas in power systems for FACTS control," *in Proceedings of the IEEE PES PowerTech Conference*, Lausanne, Switzerland, 2007.

[C5] G. Glanzmann and G. Andersson, "Incorporation of N-1 Security into Optimal Power Flow for FACTS control," *in Proceedings of the Power Systems Conference and Exposition*, Atlanta, USA, 2006.

[C4] G. Glanzmann and G. Andersson, "FACTS control for large power systems incorporating security aspects," *in Proceedings of the X SEPOPE*, Florianopolis, Brazil, 2006.

[C3] G. Glanzmann and G. Andersson, "Coordinated control of FACTS devices based on Optimal Power Flow," *in Proceedings of the 37th North American Power Symposium*, Ames, USA, 2005.

[C2] G. Glanzmann and G. Andersson, "Using FACTS devices to resolve congestions in transmission grids," *in Proceedings of Cigre/IEEE PES Symposium*, San Antonio, USA, 2005.

[C1] G. Glanzmann, M. von Siebenthal, T. Geyer, G. Papafotiou, M. Morari, "Supervisory water level control for cascaded river power plants," *in Proceedings of the Hydropower Conference*, Stavanger, Norway, 2005.

Talks

[T29] "Smart Grid: Control Infrastructure for the Future Electric Power System," Silicon Valley Dean's Council, September 2011

[T28] "Smart Grid: Control Infrastructure for the Future Electric Power System," PSII: Smarter Energy Local Interest Group, CMU, Pittsburgh, September 2011

[T27] "A Hybrid Approach to Balance the Variability and Intermittency of Renewable Generation," PowerTech Conference, Trondheim, Norway, June 2011

[T26] "Real-Time Control of Energy Storage Devices in Future Electric Power Systems," PowerTech Conference, Trondheim, Norway, June 2011

[T25] "A Hybrid Approach to Balance the Variability and Intermittency of Renewable Generation," Chalmers University, Gothenburg, Sweden, May 2011

[T24] "Scheme based on Regression Analysis for the Determination of Power Flow Control Device Settings," Lineus Excellence Center, Lund University, Lund, Sweden, May 2011

[T23] "A Hybrid Approach to Balance the Variability and Intermittency of Renewable Generation," Arizona State University, April 2011

[T22] "Potential of Storage and Hydro Power for the Integration of Intermittent Renewable Resources," University of Michigan, March 2011

[T21] "The potential of hydro power for the integration of wind generation," CMU Electricity Conference, March 2011

[T20] "Potential of Storage and Hydro Power for the Integration of Intermittent Renewable Resources," IEEE PES Pittsburgh Chapter, February 2011

[T19] "The Value of Predictive Control in the Future Electric Power System," Center for Advanced Process Decision-making (CAPD), Carnegie Mellon University, January 2011

[T18] "Future Electric Power System: Challenges and Opportunities," CMU Alumni Chapter, Princeton, November 2010

[T17] "Smart Grid Research at CMU," President's Weekend, Carnegie Mellon University, October 2010

[T16] "Coordinated Control and Optimization in Electric Power Systems," ABB, Raleigh, October 2010

[T15] "Coordination of Intermittent Generation with Storage, Demand Control and Backup Generation," iREP Symposium - Bulk Power Systems Dynamics and Control, Armação de Búzios, Brazil, August 2010

[T14] "Control of Power Flow Control Devices in the Electric Power System," CEIC Seminar, Engineering and Public Policy Department, Carnegie Mellon University, April 2010

[T13] "Systems Aspects of Storage for Wind Integration," 6th Annual Carnegie Mellon Conference on the Electricity Industry, Pittsburgh, March 2010

[T12] "Using FACTS and smart control to move more power through the transmission system," Senate Staff Briefing, Washington DC, January 2010

[T11] "Research in Electric Power Systems at Carnegie Mellon University," PA Region 13 Full Scale Utility Subcommittee Meeting, October 2009

[T10] "Decentralized Optimal Power Flow Control for the Coordination of Power Flow Control devices," Carnegie Mellon University, October 2008

[T9] "Coordinated Control of FACTS Devices for Security Enhancement," Second Manchester Seminar for young researchers in power systems, September 2007

[T8] "Coordinated control of FACTS devices in power systems for security enhancement," *iREP Symposium - Bulk Power Systems Dynamics and Control*, Charleston, USA, August 2007.

[T7] „Multi-area control of overlapping areas in power systems for FACTS control," *IEEE PES PowerTech Conference*, Lausanne, Switzerland, July 2007.

[T6] "Supervisory Water level Control for Cascaded River Power Plants," Model Predictive Control Seminar, ETH Zurich, march 2007

[T5] "Improvement of Steady-State Security in Power Systems by the Usage of FACTS Devices," Delft Center for Systems and Control, TU Delft, October 2006

[T4] "Incorporation of N-1 Security into Optimal Power Flow for FACTS control," *Power Systems Conference and Exposition*, Atlanta, USA, October 2006.

[T3] "FACTS control for large power systems incorporating security aspects," *X SEPOPE*, Florianopolis, Brazil, May 2006.

[T2] "Coordinated control of FACTS devices based on Optimal Power Flow," *37th North American Power Symposium*, Ames, USA, October 2005

[T1] "Using FACTS devices to resolve congestions in transmission grids," *Cigre/IEEE PES Symposium*, San Antonio, USA, October 2005

Outreach and Mentorship

[M7] Instructor, Summer Engineering Experience for Girls, July 2011

[M6] Mentor of 2 Master students, Fall 2010

[M5] Panelist, "Incoming Faculty Orientation", CMU, August 2010

[M4] Lab Assistant, Summer Engineering Experience for Girls, July 2010

[M3] Faculty Judge CIT Poster Session, Annual Meeting of the Minds Undergraduate Research Symposium, May 2010

[M2] Mentor of 12 undergraduate students, Fall 2009 / Spring 2010 / Spring 2011

[M1] "My way to CMU," invited talk at Women in ECE (WinECE) Fall Dinner, Sept. 2009.

References

Available upon request