Tuyen Vu

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Objective

I am an enthusiastic control engineer in power electronics and power systems with PhD degree in Electrical Engineering. I am seeking a position in power systems, smart grid, microgrids, and power electronic applications

Summary of Qualifications

- PhD in electrical engineering focusing on advanced control for microgrids
- Power systems modeling, analysis, control, planning, and optimization
- Real-time power transmission and distribution systems simulation and hardware-in-the-loop experiments
- Five years working in the power electronic applications for power systems, motor drives, microgrids, and smart grid technologies

Experience

Postdoctoral Research Associate Aug 2016 - Present

Center for Advanced Power Systems; Tallahassee, FL

- Proposal Writing: Writing research proposals to DOE, NSF, and ONR in smart grid technologies
- Project (DOE): Modeling & Validation of Electrolyzers in Real Time Grid Simulation (Aug 2016 - Present)
  - Power distribution model development and real-time simulation verification in RTDS of the distribution system of the Bay area in California
- Project (ONR): Distributed Power and Energy Management for All-electric Ships (Aug 2016 - Present)
  - Distributed power control and energy management algorithms development for all-electric ships
- Project (NSF): Distributed Energy Management of FREEDM Systems (Aug 2016 - Present)
  - Development and HIL implementation of energy management schemes for renewable energy systems
  - AC/DC microgrids control and management in handling high renewable energy penetration

Graduate Research Assistant Aug 2013 - Aug 2016

Center for Advanced Power Systems; Tallahassee, FL

- Project (DOE): Modeling & Validation of Electrolyzers in Real Time Grid Simulation (Aug 2015 - Aug 2016)
  - Implementing real-time simulation in RTDS for the 84-node distribution system of the Bay area in California using the dynamic data provided by the Idaho National Laboratory and the PG&E Company
- Project (ONR): Distributed Control (Feb 2014 - Aug 2016)
  - Designed a distributed adaptive control algorithm residing above the droop control level for a 400VDC microgrid of two AC/DC power electronic converters to improve the transient response of the system
  - Simulation and hardware validation of the designed distributed secondary control algorithm for a microgrid with voltage and current information exchange between DSP controllers of two 5kW power electronic rectifiers via CAN to stabilize a 400VDC bus voltage, and share the power between converters
  - Led a team to implement a predictive energy management strategy for a 400VDC/10kW testbed, in which the algorithm is embedded in NI devices (myRIO) of power electronic rectifiers, inverters, energy storage (NHR9200), and loads (BK precision, NHR4600) communicate with each other via Ethernet.
  - Led a team to implement a 5 kVA three-phase power electronic inverter (DC/AC) for electric motor load
  - Detected problems and conducted solutions for the failure in sensors, cables, PCB boards, and power electronic components of active rectifiers and inverters
- Project (ONR): Fault Management, Protection and Reconfiguration (Aug 2013 - Feb 2014)
  - Created a Java-based program for natural language processing using text recognition for functional faults detection (FMEA) in MVDC ship power systems

Graduate Research Assistant Aug 2014 - Aug 2015

NSF FREEDM Systems Center; Raleigh, NC

- Project (NSF): MPC-based Distributed Control for Intelligent Energy Management of FREEDM Systems
  - Developed an energy prediction model for a 20 kW interconnected renewable energy system
  - Optimized power flows in a renewable energy system utilizing model predictive control for 20% cost reduction

Hardware Engineer June - Sep 2012

Samsung Vietnam Mobile R&D Center; Hanoi, Vietnam

- Supported the production engineers in mobile faults detection in the Application and Radio parts
- Analyzed the power amplifier circuits inside mobile phones, collaborated with system team in firmware design

Undergraduate Research Assistant June 2010 - June 2012

Center for Technology Innovation; Hanoi, Vietnam

- Achieved 50% electromagnetic torque ripple reduction in BLDC motor using a new control method
- Extended the BLDC maximum speed up to 1.47 times compared with the conventional method

Education

Florida State University, Tallahassee, FL August 2016

- PhD in Electrical Engineering; GPA: 4.0/4.0
- *Dissertation topic*: Robust Adaptive Droop Control for DC Microgrids
  A robust advanced adaptive control with high performance in transient response is developed for adapting the droop constants to overcome the restriction of the conventional droop control in DC Microgrids, which is the trade-off between current share among distributed energy resources and BUS voltage stability
- EIT (Passed Fundamentals of Engineering Exam) (02/19/2016)

Hanoi University of Science and Technology, Hanoi, Vietnam June 2012

- *Bachelor's Thesis*: Pseudo-vector Control is investigated to minimize torque ripple in BLDC motor

Selected Publications and Presentations

- T. Vu, *et al.*, "An Alternative Distributed Control Architecture for Improvement in the Transient Response of DC Microgrids," *IEEE Trans. Ind. Electron.*, 2016 (Accepted for publication)
- T. Vu, *et al.*, "Robust Adaptive Droop Control for DC Microgrids," *IEEE Trans. Ind. Electron.*, 2016 (Under Review)
- T. Vu, *et al.*, "A Predictive Energy Management Strategy for Autonomous Ship Power Systems," *IEEE Trans. Energy Convers.*, 2016 (Under Review)
- T. Vu, *et al.*, "Model Predictive Control for Power Control in Islanded DC Microgrids," *IEEE IECON 2015*
- T. Vu, *et al.*, "Real-time Distributed Power Optimization in the DC Microgrids of Shipboard Power Systems," *IEEE Electric Ship Technologies Symposium*, 2015

Technical Skills

Languages: C, C++, Java, Python, PLC Programming, Latex

Software: MATLAB/Simulink, Labview, RSCAD, PSCAD, OpenDSS, PSS/E, PLECS, PSIM, Altium, Multisim, CCS, Word, Excel

Technology: Power electronics, PCB design and implementation, filters design, real-time digital simulators (RTDS), numerical methods, NI myRIO, embedded DSP programming, hardware-in-the-loop, dSPACE

Honors/Awards

- INL research assistantship: DOE grant (Aug 2015 - Aug 2016)
- FREEDM research assistantship: NSF grant (Aug 2014 - Aug 2015)
- ESRDC research assistantship: ONR grant (Aug 2013 - Aug 2016)
- US government fellowship (VEF), ($54000 award), (2013), (Declined)
- Samsung Scholarship: Awarded $1000, (2012)

Professional Affiliations

- *Reviewer*, IEEE Transactions on Energy Conversion, Electric Power Systems Research Journal - Elsevier, IEEE Transactions on Power Electronics, IEEE Journal of Emerging and Selected Topics in Power Electronics
- *Mentor*, FREEDM Pre-college Education Program (2015)
- *Student member*, IEEE, (2014 - Present)