

UTILITY APPLICATIONS OF POWER ELECTRONICS

UI: ECE 529

Class Project

The ECE529 class project will consist of a 5-7 page paper (with an appendix if needed) describing an aspect of utility applications of power electronics. The paper can be either single or double column (IEEE format) with single spacing, 12 point font (if you're not sure of the IEEE format, you can go to <http://www.ieee.org/power> and follow the link for "Information for Authors" and then "Technical Papers"). I can provide references to help you get the background information for your paper.

If you do a simulation project, describe your simulation model, and also hand in the input data files. Possible topics include:

1. Discussion of multiterminal HVdc systems (with or without simulations)
2. In depth study of a VSC HVdc application
3. Addition of SMES to dc bus of SSSC, STATCOM and/or UPFC
4. Develop and demonstrate more complete EMTP model of FACTS, HVDC light Custom Power devices, etc. Document model and show results.
5. Develop and demonstrate more complete power flow or stability models of FACTS, HVDC light etc. Document model and show results.
6. Impact of FACTS devices on system protection
7. Impact of Custom Power devices on system protection
8. Modeling and analysis of power electronic interface for microturbines, fuel cells, photovoltaics, etc.
9. Modeling and analysis of power electronic interface and an energy storage system (battery, SMES, flywheel, ultracapacitor).
10. Many additional topics are also possible, but need to be cleared with me first.

DUE DATES

Part 1 Choose topic and write a brief abstract and outline. Due April 11 (on-campus) or April 18 (Outreach) or whenever practical around that time. Worth 15% of the project grade.

Part 2 Final paper is due May 2 (on campus) or May 9 (Outreach). Copies of the papers will be sent to your classmates.