Adaptive Critic Designs (AeroE, CpE, EE, SysEng 458)

Section A: Spr 2013       Class Hours: TTh 8-9:15       Room:  239 EECH or DIS

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Prerequisites: At least one graduate course in statistics, data mining, algorithms, computational intelligence, or neural networks, consistent with the student’s degree program.

Text: None. Required readings will be assigned. Worthwhile reference texts include:
Handbook of Intelligent Control, (the whole book is good, get Ch. 3 for free here:
http://www.werbos.com/HICChapter3.pdf)
Neural Networks: A Comprehensive Foundation, Haykin, Pearson (many editions exist)

For other relevant readings, see:
http://www.werbos.com/Mind.htm
http://www.derongliu.org/
(And follow the ADP depository link from there.)
http://people.mst.edu/faculty/dwunsch_profile.html
(And follow the Google Scholar profile link from there.)

Also, I have uploaded many relevant papers to the course’s Blackboard Content page.

Catalog Description: Review of Neurocontrol and Optimization, Introduction to Approximate Dynamic Programming (ADP), Reinforcement Learning (RL), Combined Concepts of ADP and RL - Heuristic Dynamic Programming (HDP), Dual Heuristic Programming (DHP), Global Dual Heuristic Programming (GDHP), and Case Studies.
**Grading:** Your grade will be based on the following:

- Bibliography 10%
- Presentations 15%
- Design Project (Report and Presentation) 75%

For each article or chapter you read, you need to write an annotation of at least a sentence and no more than a paragraph. You will prepare a document with all of these. The combined quantity and quality of these will form your bibliography grade.

You will have presentations on your own research interests and on some of the papers you are reading. The grade will depend just as much on delivery as on content. The design project will be a use of adaptive critic designs in your own research.

The classes will consist of my lectures, guest lectures, and your presentations, plus discussions. We will figure out the time allowance and schedules of your presentations soon, after we have seen how many of you are signed up.

**Policies:** Collaboration is permitted and encouraged. You will have great latitude over research papers and seminars, so go ahead and begin exploring. This is a graduate seminar course, so you need to read and study based on presentations in class as well as the literature outside of class, and incorporate that into your own research.

**Welcome to the class!**