DANIEL M. WEBB

3003 Valmont Rd. #143   303-524-4182
Boulder, CO 80301   daniel@danielwebb.us

SUMMARY

Upcoming chemical engineering Ph.D. graduate seeking full-time position in R&D, process engineering or process control.

EDUCATION AND EXPERIENCE

University of Colorado   **2000-2007**
Ph.D. Chemical and Biological Engineering (GPA 3.8/4.0)
Dissertation: Hybrid dynamic modeling and identification
Advisor: W. Fred Ramirez
Invented mathematical techniques and software for optimizing dynamic systems.

- Invented new technique for hybrid model identification; the first that can identify mixed (continuous/discrete) hybrid (mechanistic/empirical) models with missing states
- Developed 75,000+ line C software package to implement new techniques using an object-orientated design focused on principles of maintainability
- Created 10-machine computational cluster including the design, assembly, and writing custom management software
- Improved iterative dynamic programming (IDP) optimal control algorithm by 5-100 times for Baxter model below
- Released first library implementation of the IDP algorithm

Baxter Hemoglobin Therapeutics   **2001**
Assisted recombinant *E. coli* bioreactor scale-up through modeling and basic process studies.

- Developed an improved *E. coli* model to predict acetate and foreign protein production
- Assisted with several pilot-plant experimental batches

Los Alamos National Laboratory   **1998-1999**
Jointly implemented a large fuel cell system and improved system monitoring.

- Independently designed and built novel monitoring instrument for fuel cell systems saving $20,000+ for a single test station
- Learned electronic circuit design, PCB design, PCB fabrication, microcontroller system design, and microcontroller programming to build monitoring instrument
- Reverse-engineered consumer embroidery machine to create custom fuel cell backings
- Designed and milled plate hardware using a CAD/CAM system
- Assisted with Labview-based automated fuel cell monitoring

University of Arkansas   **1992-1997**
B.S. Chemical Engineering (GPA 3.7/4.0)
- National Merit Scholar (all-inclusive scholarship)
- Engineer In Training
- NSF summer internships (competitive, paid):
    - Virginia Tech (1996) – Water-soluble polymer adsorption
    - NASA Langley (1997) – Microwave ceramic sintering

TECHNICAL SKILLS

Software
- Programming languages (with approximate skill level 1-5):
    C(5), bash(5), Python(4), C++(3), FORTAN(3), MATLAB(3),
    Labview(3), SQL(3), Java(2), PLC(2), Assembler(2)
- System control using PLCs (taught basic PLC programming to undergraduates)
- Unix/Linux system administration (5 years experience with web, email, DNS, database, backup, VoIP, and VPN servers)
- Web design including HTML/CSS and dynamic web frameworks such as PHP and Zope

PERSONAL INTERESTS

Boombuster.com   **2004-2007**
- Invented Boombuster noise-canceling CD (masks bass boom from music)
- Sold business with >100% overall ROI in 2007

Mechanics
- Auto mechanic (repairs own cars: timing belt, valve adjustment, brakes, etc)
- Woodworker (designed and built own solid-wood king bed)

Other Interests
- Snow skiing, Aikido, Classical music, Wilderness hiking, Travel, Certified ultralight pilot

PUBLICATIONS AND PRESENTATIONS

Webb, D.M and Ramirez, W.F. (submitted), "Identifying a hybrid dynamic mechanistic/empirical model using optimal control," *Automatica*.

Webb, D.M. and Ramirez, W.F. (submitted), "Improvements to the iterative dynamic programming optimal control algorithm," *Computers and Chemical Engineering*.

Webb, D.M. (2007), Hybrid dynamic modeling and identification, Ph.D. thesis, University of Colorado at Boulder.

Laursen, S.O., Webb, D.M. and Ramirez, W.F. (2007), "Dynamic hybrid neural network model of an industrial fed-batch fermentation process to produce foreign protein," *Computers and Chemical Engineering*, **81**, 163-170.

Webb, D.M. (2004), "Hybrid dynamic modeling and optimization," *Poster session at AIChE annual meeting, Austin, Texas, November 7-12*.

Webb, D.M. and Ramirez, W.F. (2003), "Modeling, simulation, and optimization framework for dynamic systems," *Proceedings of the American Control Conference, Denver, Colorado, June 4-6*, 2395-2400.

Webb, D. and Møller-Holst, S. (2001), "Measuring individual cell voltages in fuel cell stacks," *Journal of Power Sources,* **103**, 54-60.