Curriculum Vitae
David R. Chesney
Electrical Engineering and Computer Science Department
The University of Michigan

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Education

Doctor of Philosophy, Computer Science
Michigan State University, East Lansing, MI
(1995)

Research in the application of *Software Engineering* to compiler design for parallel architecture machines. Specifically, formal representation of matrix-based approaches to ordering loop transformations in order to minimize software processing time and maximize processor utilization. **Honors**: General Motors Corporation Fellowship.

Master of Science, Computer Science
Michigan State University, East Lansing, MI
(1991)

Master's project on *Hypermedia* and *Natural Language* approaches to capture knowledge from a manufacturing environment. Construction of database and development of user-friendly techniques to access information. **Honors**: General Motors Corporation Fellowship.

Master of Science, Mechanical Engineering
Michigan State University, East Lansing, MI
(1987)

Elective coursework in structural analysis and artificial intelligence, including *Expert Systems* and *Computer Vision*. Thesis research on expert system design and construction for manufacturing scrap diagnosis. **Honors**: Mechanical Engineering Department Fellowship; General Dynamics Corporation Research Grant.

Bachelor of Mechanical Engineering, Automotive Option
General Motors Institute (*now Kettering University*), Flint, MI
(1984)

Elective coursework in automotive design, empirical stress analysis, and finite element analysis. **Honors**: Student Body President; *Who's Who among Students in American Colleges and Universities*, 1982 and 1983; Management Honor Society.

Work Experience: Academics

Lecturer IV
Electrical Engineering and Computer Science Department, University of Michigan, Ann Arbor, MI
(2001-present)

Primary responsibility for the following courses:
- o ENGR100 Gaming for the Greater Good. Introduction to Engineering course with focus on developing socially relevant software games.
- o EECS281 Data Structures and Algorithms. Core curriculum for all Computer Science students.
- o EECS481 Software Engineering. Elective capstone course. Focus on developing software/hardware for children with cognitive and/or physical disabilities.
- o Other Courses Taught: EECS203, EECS270, EECS496, ENGR195 (Multi-Disciplinary Engineering)

Adjunct Faculty
Electrical Engineering and Computer Science Department, University of Michigan, Ann Arbor, MI
(1998-2001)

Primary responsibility for EECS 486. Elective senior-level Object Oriented Software Development course.

Visiting Assistant Professor
Computer Science Department, Michigan State University, East Lansing, MI
(1996-1997)

Develop syllabus, coursework, exams, labs, and meaningful projects for Senior/Graduate level Software Engineering course.

Lecturer
Computer Science Department, Eastern Michigan University, Ypsilanti, MI
(1996)

Develop syllabus, coursework, and exams for introductory Programming Language course.

Adjunct Professor
College of Science Engineering and Technology, Saginaw Valley State University, Saginaw, MI (1987-1994)

Develop syllabus, coursework, and exams for introductory Mechanical Design course.

Work Experience: Industry
Algorithm Technical Resource Leader
Electronics Integration and Software Development Department, General Motors Corporation, Milford, MI
(1996-2001)

Requirements elicitation for infrastructure and engine protection algorithms. Development of standards for requirements documentation and for software integration testing. Management responsibility to build common solutions to various projects through consensus.

Senior Project Engineer
Design Center, Powertrain Transmissions, General Motors Corporation, Ypsilanti, MI
(1995-1996)

Requirements, Design, and Implementation of rule-based design tools for transmission products. Development of software engineering methodologies for product design tools. Patent coordination for GM Powertrain Transmissions.

Senior Project Engineer
Technology and Engineering Services, Central Foundry Division, General Motors Corporation
Saginaw, MI (1987-1990)

Evaluation, implementation, and application of computer tools for the foundry. Coordinate and advise several undergraduate theses and projects related to Computer Aided Engineering and Artificial Intelligence.

Project Engineer and Cooperative Student
Product Engineering and Reliability Department, Central Foundry Division, General Motors Corporation, Saginaw, MI
(1979-1985)

Project management responsibility for design and development of prototype engine components. Two years experience using GE/Calma computer graphics system. Lab experience with empirical stress and material analyses.

Research

Pedagogy, Ethics and technology, Socially relevant computing, Assistive Technology, Story-telling in the Engineering classroom, Effective groupwork in the classroom, Introversion, K-12 Outreach

Service

- K-12 Outreach, including numerous AY school visits and the following summer camps:
  - It's All About the Music (target audience: high school students from under-represented populations);
  - WISE-GISE (target audience: middle school girls);
  - Grace Hopper Project (target audience: high school girls);
  - ENGAGE (target audience: high school girls);
  - LEAD (target audience: under-represented minorities);
  - CS4HS (target audience: high school CS teachers)
- Socially Relevant Computing

Awards and Grants

- R & M Schultz Outreach and Diversity Award, College of Engineering, University of Michigan, 2014;
- Thomas Sawyer Teacher of the Year Award, College of Engineering, University of Michigan, 2010;
- Outstanding Instructor in the Engineering College, from the Society of Women Engineers: 2004;
- Best Paper Award, New Engineering Educators Division, American Society of Engineering Education Conference, 2007;
- Numerous College of Engineering Grants, including:
  - Curricular Innovation Grant in Undergraduate Engineering Education: 2010
- Numerous Center for Research on Learning and Teaching (CRLT) Grants, including:
  - Lecturers Professional Development Grant: 2003, 2005;
  - Multimedia Grant: 2005;
  - Faculty Development Grant: 2007;
  - Investigating Student Learning Grant: 2007;
  - Gilbert Whitaker I Grant for the Improvement of Teaching: 2012;
  - Gilbert Whitaker II Grant for the Improvement of Teaching: 2014;
- Numerous Corporate Grants, including:
  - Microsoft Grant for K-12 Outreach: 2004, 2005, 2006, 2007, 2008;
  - Google Grant for K-12 Outreach: 2008;
  - Lockheed Martin Grant for Socially Relevant Computing: 2008;
  - John Deere Grant for Socially Relevant Computing: 2008
- Several Equipment Donations for use in K-12 Outreach, including:
  - Laptops donated from CAEN, Lilly, and Hewlett Packard;
  - MacBook Pros, iPads, and mini-iPads donated from Apple;
  - Surface RTs and Kinect Sensors donated from Microsoft;
  - 3D Interactive Gesture Cameras donated from Intel.

Recent 'Other'

- Delivered TEDxUofM speech, entitled 'Whispers and Shouts' (April, 2013);
- Invited speaker for plenary session at Entertainment Software and Cognitive Neurotherapeutics Society (ESCoNS) (March, 2013);
- Feature Article on Story-Telling in ASEE National Magazine *Prism* (January, 2009);
- Feature Article in *Michigan Engineer* (Fall, 2009 Edition of Alumni magazine) on Outreach Efforts;
- Invited panel member in public forum for Dep't of Ed. National Technology Plan (October, 2009);
- Keynote Speaker at Tau Beta Pi Awards Dinner (December, 2009).

Relevant URLs

http://www.engin.umich.edu/newscenter/dme/gaming/ : Digital Multimedia Experience re/ Gaming for the Greater Good;

http://www.youtube.com/watch?v=KGE-sTD0Zdk&feature=youtu.be : YouTube video re/ D Chesney;

http://www.youtube.com/watch?v=CUT-Chcffqc&feature=youtu.be : YouTube video re/ EECS481 Software Engineering class (W'12) focus on Autism;

http://dailyedventures.com/index.php/2012/04/09/gaming-for-the-greater-good-a-computer-science-professor-takes-on-real-needs-for-real-people-usa/ : webpage by Microsoft focusing on contributions through Gaming for the Greater Good;

http://forum.engin.umich.edu/2010/11/mobile-communications-technology-for.html : webpage and video re/ EECS481 project to build text/email app for people with Cerebral Palsy

Publications

General Pedagogy

Big Fish III: But, Does Story-Telling Work?, at the American Society of Engineering Educators Conference (abstract accepted), Louisville, Kentucky, June, 2010.

Big Fish II: The Lost Science of Story-Telling in the Engineering Classroom, at the American Society of Engineering Educators Conference (received Best Paper Award), Honolulu, Hawaii, June, 2007.

Big Fish: The Lost Art of Story-Telling in the Engineering Classroom, at the American Society of Engineering Educators Conference (nominated for Best Paper Award), Chicago, Illinois, June, 2006.

J. Schox and D. Chesney, **Understanding Patent Law and Strategy for Engineers and Entrepreneurs**, at the American Society of Engineering Educators Conference (abstract accepted), Honolulu, Hawaii, June, 2007.

J Ringenberg and D. Chesney, **MYSPACE in the Classroom: Classroom Note Taking Collaboration via a Social Networking Model**, at the American Society of Engineering Educators Conference (abstract accepted), Honolulu, Hawaii, June, 2007.

Reality Check: Student Reflection on Groupwork, at the Frontiers in Education Conference, Boulder, Colorado, November, 2003.

K-12 Outreach

From Egg Drops to Gum Drops: Teaching Fourth Grade Students about Engineering, at the American Society of Engineering Educators Conference, Nashville, Tennessee, June, 2003.

Space Weather

A.J. Ridley, T. Gombosi, G. Toth, O. Volberg, I. Sokolov, D. De Zeeuw, K. Hansen, D. Chesney, K. Powell, K. Kane, R. Oehmke, Q. Stout, **Space Weather Modeling Framework: An Overview and Application to the October 29, 2003 Storm**, *Huntsville 2004 Workshop*, Huntsville, AL, October 18-22, 2004.

A.J. Ridley, T. Gombosi, G. Toth, O. Volberg, I. Sokolov, D. De Zeeuw, K. Hansen, D. Chesney, K. Powell, K. Kane, R. Oehmke, Q. Stout, **Comprehensive Solar-Terrestrial Environment Model for Space Weather Predictions: Progress of the Space Weather MURI Projec**t, *2004 Space Weather Week*, Boulder, CO, April 13-16, 2004.

T.I. Gombosi, R. Clauer, K. Powell, Q. Stout, D. Chesney, D. De Zeeuw, K. Hansen, K.Kane, J. Kozyra, M. Liemohn, W. Manchester, A. Ridley, I. Roussev, I. Sokolov, G. Tóth, O. Volberg, **Center for Space Environment Modeling (CSEM)**, *2003 GEM Meeting*, Snowmass, Colorado, June 23-27, 2003.

A.J. Ridley, T. Gombosi, G. Toth, I. Sokolov, D. De Zeeuw, D. Chesney, O. Volberg, K. Powell, Q. Stout, K. Hansen, K. Kane, **Space Weather Modeling Framework: An Overview and Application to the October 29, 2003 Storm**, *2004 Fall AGU Meeting*, San Francisco, CA, December 13-17, 2004.

T. Gombosi, G. Toth, O. Volberg, I. Sokolov, A.J. Ridley, D. De Zeeuw, K. Hansen, D. Chesney, K. Powell, K. Kane, R. Oehmke, Q. Stout, **Space Weather Modeling Framework: An Overview**, *2004 Spring AGU Meeting*, Montreal, Canada, May 17-21, 2004.

Volberg, O., Tóth, G., Sokolov, I., Ridley, A. J., Gombosi, T. I., De Zeeuw, D. L., Hansen, K. C., Chesney, D. R., Stout, Q. F., Powell, K. G., Kane, K. J., Oehmke, R. C., **Doing It In The SWMF Way: From Separate Space Physics Simulation Programs To The Framework For Space Weather Simulation**, *2003 Fall AGU Meeting*, San Francisco, CA, December 8-12, 2003.

G. Toth, O. Volberg, A.J. Ridley, T.I. Gombosi, D. De Zeeuw, K.C. Hansen, D.R. Chesney, Q.F. Stout1, K.G. Powell, K. Kane, R. Oehmke, **A Physics-Based Software Framework for Sun-Earth Connection Modeling**, *Conference on Sun Earth Connections: Multiscale Coupling of Sun-Earth Processes*, Kona, HI, February 9-13, 2004.

G. Toth, O. Volberg, A.J. Ridley, T.I. Gombosi, D.L. De Zeeuw, K.C. Hansen, D.R. Chesney, Q.F. Stout, K.G. Powell, K.J. Kane, R.C. Oehmke, **A Physics-Based Software Framework for Sun-Earth Connection Modeling**, in *Proceedings of the Sun-Earth Connection Conference*, edited by A.T.Y. Lui, Y. Kamide, and G. Consolini, Elsevier Publishing, in press, 2004.

Automotive

Generalized Equations for Sprag One-way Clutch Analysis and Design. With John M. Kremer. In proceedings of the *1998 Society of Automotive Engineers International Congress and Exposition* and *1998 Transactions*, Paper No. 981092.

Generalized Equations for Roller One-way Clutch Analysis and Design. With John M. Kremer. In proceedings of the *1997 Society of Automotive Engineers International Congress and Exposition* and *1997 Transactions*, Paper No. 970682.

Genetic Algorithms Applied to the Optimization of One-way Clutch Design. In proceedings of the *Eighth Annual Transmission Technology Symposium*, General Motors Corporation, September 1996.

ICAD Tool for One-way Clutch Design. In proceedings of the *Seventh Annual Transmission Technology Symposium*, General Motors Corporation, September 1995.

Generalizing the Unimodular Approach. In proceedings of the *1994 International Conference on Parallel and Distributed Systems*, December 1994.

A Formal Approach to Automatic Source Code Translation for Parallel Architectures. Technical Report CPS-91-15, Michigan State University, October 1991.

Computer Based Tools to Communicate Lessons Learned. In proceedings of the *Product Engineering Technology Conference*, General Motors Corporation, May 1990.

Casting Shrink Defect Elimination Using SOLCAST. In proceedings of the *Manufacturing Technology Conference*, General Motors Corporation, May 1989.

Almost Real-Time Diagnosis and Correction of Manufacturing Scrap Using an Expert System. In proceedings of the *Society of Automotive Engineers/Engineering Society of Detroit International Computer Graphics Conference and Exposition*, April 1987.

Informal and Formal Models of Software Engineering for Automotive Applications. Presented at University of Michigan Automotive Engineering Seminar Series, November 1998.

Application of the Unimodular Approach to Loop Fission and Loop Fusion. Presented at *Scaleable High Performance Computing Conference*, May 1994.

Formal Specification of an Automatic Source Code Translator for Parallel Computer Architectures. Presented at *Minnowbrook Workshop on Software Engineering for Parallel Computing*, Syracuse University, August 1992.

Computers in the Foundry. Presented at *Solidification Modeling Conference*, October 1990.

Matrix-Based Representations of Loop Transformations. Dissertation for Doctor of Philosophy degree at Michigan State University, May 1995.

Almost Real-Time Diagnosis and Correction of Manufacturing Scrap Using an Expert System. Thesis for Master of Science degree in Mechanical Engineering, Michigan State University, August 1987.

Finite Element Modeling of Castings. Thesis for Bachelor of Mechanical Engineering degree at General Motors Institute, June 1984.

Engine Shutdown as a Result of Continuous Powertrain Protection Mode. In *Research Disclosure*, September 1998, Number 41325.