

Curriculum Vitae
Dave Goldberg
PO Box 699
Douglas, Michigan 49406 USA
Phone: 1-217-621-2645
Web: www.threejoy.com
E-mail: deg@threejoy.com

Profile

- **Impossible missions sherpa.** Tackle complex, ambiguous tasks with care, creativity, drive & verve.
- **Conceptual, social & aspirational long jumper.** Connect dots between disparate ideas, people & purposes.
- **Authentic speaker, author, and thought leader.** Communicate with clear, authentic voice & presence.
- **Globally recognized scholar.** Wrote book that launched genetic algorithms & founded workshop that launched philosophy of engineering.
- **Wholehearted husband, father, friend & coach.** Live in present moment with connection, love & curiosity.

Education

Certificate in Leadership Coaching, School of Continuing Studies, Georgetown University, Washington, DC, March 2011.

Doctor of Philosophy, Civil Engineering, University of Michigan, Ann Arbor, MI, 1983.

Dissertation: *Computer-Aided Gas Pipeline Operation Using Genetic Algorithms and Rule Learning*.

Master of Science in Engineering, Civil Engineering, University of Michigan, Ann Arbor, MI, 1976.

Bachelor of Science in Engineering, Civil Engineering, University of Michigan, Ann Arbor, MI, 1975.

Other recent continuing education. *Team Coaching & Human Dynamics*, One21Live/MiroGroup, 2013;

Wade Rouse Writing Workshop, 2013; *Negotiation & Leadership*, Harvard Program on Negotiation, 2012;

Drawing on the Right Side of the Brain, Brian Bomeisler, 2011.

Experience

Contributor, Huffington Post, June 2012-present.

Founder & President, Big Beacon, Douglas, MI, January 2012-present.

Founder & President, ThreeJoy Associates, Inc., Douglas, MI, May 2010-present.

Distinguished Visiting Professor, Design-Centric Curriculum, Faculty of Engineering, National University of Singapore, 2 months per year, 2010-present.

Visiting Scholar, Department of Philosophy, Faculty of Technology, Policy & Management, Delft University of Technology, June & September 2011.

Advisor, Illinois Foundry for Innovation in Engineering Education, 3 months per year, 2011-present.

Co-Director & Co-Founder, Illinois Foundry for Innovation in Engineering Education, UIUC, 2007-2010.

Professor, School of Labor and Employment Relations (25% appointment), UIUC, 2009-2010.

Jerry S. Dobrovolny Distinguished Professor in Entrepreneurial Engineering, UIUC, 2003-2010, emeritus status granted 2011.

Professor, Department of Industrial & Enterprise Systems Engineering, UIUC, 2006-2010.

Departmental Affiliate, Department of Computer Science, UIUC (0% appointment), 2005-2010.

Co-Founder & Chief Scientist, ShareThis, Inc. (formerly Nextumi, Inc.), 2004-2010.

Consultant, Schema Ltd., *Led genetic algorithm improvement initiative*, 2002-2004.

Professor, Department of General Engineering, UIUC, 1993-2006.

Visiting Professor, Graduate School of Systems Management, Tsukuba University, Tokyo, December 1999.

Visiting Scholar, Medical Informatics, Stanford, Spring 1998; University of Dortmund, Fall 1997.

Assistant Dean, College of Engineering, UIUC, 1993-1994.

Associate Professor, Department of General Engineering, UIUC, 1990-1993.

Associate Professor, Department of Engineering Mechanics, University of Alabama, 1987-1990.

Assistant Professor, Department of Engineering Mechanics, University of Alabama, 1984-1987.

Lecturer, Department of Civil Engineering, University of Michigan, 1983.

Research-Teaching Assistant, University of Michigan, 1975-1976, 1980-1983.

Project Engineer & Marketing Manager, Stoner Associates, Inc., *Built engineering software customer support and sales, enhanced software, and led market expansion efforts*, Carlisle, PA, 1976-1980.

Hydrologist, US Geological Survey, *Initial coding resulting in BRANCH*, Reston, VA, Summer 1975.
Engineman, US Coast Guard Reserve, *Basic training, engineman school, small boat patrols, 1973-1979*.

Ten Most Influential Publications

- Goldberg, D. E. (1989). *Genetic algorithms in search, optimization, and machine learning*. Reading, MA: Addison-Wesley. **57,283**
- Goldberg, D. E., & Richardson, J. (1987). Genetic algorithms with sharing for multimodal function optimization. *Proceedings of the Second International Conference on Genetic Algorithms*, 41-49. **2,010**
- Horn, J., Nafpliotis, N., & Goldberg, D. E. (1994). A niched pareto genetic algorithm for multiobjective optimization. *Proceedings of the IEEE World Congress on Computational Intelligence*, 82-87. **1,841**
- Goldberg, D. E., & Deb, K. (1991). A comparative analysis of selection schemes used in genetic algorithms. *Foundations of Genetic Algorithms, 1*, 69-93 (1991). **1,745**
- Goldberg, D. E. and R. Lingle (1985). Alleles, loci and the traveling salesman problem. *Proceedings of an International Conference on Genetic Algorithms and Their Applications*, 154-159. **1,257**
- Goldberg, D. E., Korb, B., & Deb, K. (1989). Messy genetic algorithms: Motivation, analysis, and first results. *Complex Systems, 3*, 493-530. **1,230**
- Goldberg, D. E. (2002). *The design of innovation: Lessons from and for competent genetic algorithms*. Boston, MA: Kluwer Academic. **1,014**
- Deb, K. and D. E. Goldberg (1989). An investigation of niche and species formation in genetic function optimization. *Proceedings of the Third International Conference on Genetic Algorithms*, 42-50. **935**
- Booker, L. B., Goldberg, D. E., & Holland, J. H. (1989). Classifier systems and genetic algorithms. *Artificial Intelligence* 40(1-3), 235-282. **910**
- Pelikan, M., Goldberg, D. E., & Lobo, F. (2002). A survey of building and using probabilistic models BOA: The Bayesian optimization algorithm. *Computational optimization and applications*, 21(1), 5-20. **753**

Bold citation counts from Google Scholar. List of publications available at <http://bit.ly/17litKr>.

Thirteen Publications Related to Educational & Organizational Transformation

- Goldberg, D. E. (2006). *The entrepreneurial engineer*. Hoboken, NJ: Wiley.
- Goldberg, D. E. (2008). Last word: Bury the cold war curriculum. *ASEE Prism*, 17(8), 64.
- Goldberg, D. E. (2009). Engineering rigor and its discontents: Philosophical reflection as curative to math-physics envy [abstract]. *Proceedings of the 2009 Conference of the Society for Philosophy and Technology*.
- Goldberg, D. E. (2009). The importance of pairwork in educational and interdisciplinary initiatives. *Proceedings of the 39th ASEE/IEEE Frontiers in Education Conference*.
- Goldberg, D. E. (2010). The missing basics & other philosophical reflections for the transformation of engineering education. In D. Grasso & M. B. Burkins (eds.). *Holistic engineering education: Beyond technology* (pp. 145-158). New York: Springer-Verlag.
- Goldberg, D. E. (2010). Why philosophy, why now? Engineering responds to the crisis of a creative era. In I. van de Poel & D. E. Goldberg (eds.). *Philosophy and engineering: An emerging agenda* (pp. 255-265). Berlin: Springer.
- Goldberg, D. E. (2011). Invisible gorillas, unfair casinos, and the action orientation of engineers [abstract]. *Proceedings of the 2011 Conference of the Society for Philosophy and Technology*.
- Goldberg, D. E. (2012). Singaporean students can do X. *Innovation: The Singapore Magazine of Technology, Research, and Education*, 11(1), <http://bit.ly/SkzspR>
- Goldberg, D. E. (October 2012). A moribund profession? The vital signs may be shaky but there is a treatment. *PE Magazine*, <http://bit.ly/16Ewgus>
- Goldberg, D. E., Cangellaris, A. C., Loui, M. C., Price, R. L., & Litchfield, B. J. (2008). iFoundry: Engineering curriculum reform without tears. *Proceedings of 2008 ASEE National Conference and Exposition*.
- Goldberg, D. E. & Somerville, M. (in press). *A whole new engineer: A surprising emotional journey*. Douglas, MI: BB Press. (with Catherine Whitney)
- Somerville, M. & Goldberg, D. E. (24 September 2012). Four pillars of engineering education reform that will attract (and graduate) more students. *Huffington Post*, <http://huff.to/XpdlYB>
- Somerville, M. & Goldberg, D. E. (24 August 2012). A different kind of diversity: The changing face of engineering education. *Huffington Post*, <http://huff.to/XpdlYB>.

Other short posts/articles available: threejoy.com, bigbeacon.org, & huffingtonpost.com/david-goldberg.

Publications Summary

- Authored or co-authored over 450 publications, of which over 300 were refereed.
- First book acknowledged as tenth most cited volume on Google Scholar.
- Amassed an **h-index** score of $h = 86$ according to *Google Scholar* (h is the number of papers that have h citations or more).
- Authored 3 original **books** and 1 revised edition with .
- Edited or co-edited 7 **conference proceedings** volumes & 2 **special editions of scholarly journals**.
- Authored or supervised over 58 computer codes & platforms.
- Filed 14 **patents** with 8 issued and 6 pending.

High-Impact Graduate Students

- Karr, C. L. (1989). Known for the **application of genetic algorithms to fuzzy control** and currently **Dean of Engineering**, University of Alabama, Tuscaloosa. **h=25**
- Deb, K. (1991). Pioneer in **evolutionary multiobjective optimization** (EMO), and 2005 recipient of **Bhatnagar Prize**; currently Professor of Mechanical Engineering, IIT Kanpur. **h=76**
- Kargupta, H. (1995). Known for **distributed data mining**, 2001 recipient **NSF CAREER** award winner and **co-founder** of Agnik, LLC; currently Professor of CS at UMBC. **h=36**
- Harik, G (1997). Was **employee #8 at Google**; currently **venture capitalist** in Silicon Valley. **h=21**
- Cantu-Paz, E. (1999). Known for **parallel genetic algorithms**; currently Senior Manager, Ranking, A9 **h=24**
- Pelikan, M. (2002). Inventor of **hierarchical Bayesian optimization algorithm**; 2005 recipient of **NSF CAREER** award; currently Associate Professor of CS at UMSL. **h=35**
- Butz, M. V. (2004). Known for **learning classifier systems**; 2007 recipient of Emma Noether Award (Germany); currently Chair of Cognitive Modeling, Tübingen University. **h=31**
- Sastry, K (2007). Known for **genetic algorithm efficiency enhancement**, winner Intel Achievement Award (2010); currently software engineer (R&D) at Intel. **h=28**
- Summary:** Have advised or co-advised 20 PhD dissertations and 21 MS theses.

Honor and Award Highlights

- Distinguished Academic Partner**, Franklin W. Olin College of Engineering, 2012
- Pioneer in Evolutionary Computation**, IEEE Computational Intelligence Society, 2010
- Silver Humie** (Human Competitive Performance Award), *Multiobjective Genetic Algorithms for Multiscaling Excited-State Direct Dynamics in Photochemistry*. Genetic and Evolutionary Computation Conference, Seattle, WA, 2006
- Gold medal, Lincoln Arc Welding Award (faculty advisor)**, *Butterfly Cage Control Valve Design II*, Yearly & Associates, 2005 (also, advisor to 5 Merit awards from Lincoln Arc Welding & 3 Bernt O. Larson Awards for excellence in Senior Design)
- Outstanding Instructor Award**, *Genetic Algorithms*, National Technological University, 2001, 2000
- Gambrinus Fellow**, University of Dortmund, Germany, 1997
- Wickenden Award** (for ASEE best paper: *Change in Engineering Education: One Myth, Two Scenarios, and Three Foci*), American Society for Engineering Education, 1996
- Associate**, Center for Advanced Studies, UIUC, 1995-1996
- Presidential Young Investigator Award**, National Science Foundation, 1985-1990
- Prater Exchange Professor**, University of Alabama & National Taiwan University, 1986

Short Stories of Educational Reform & Transformation

- Change in Engineering Education.** While working as Assistant Dean in undergraduate programs office, authored 1994 paper on education reform that wins 1996 ASEE Wickenden Award for best paper & foreshadows the impact of the IT revolution on education broadly. Many of the paper's suggestions were later implemented as part of iFoundry and other initiatives. <http://bit.ly/17lvbJ8>
- Teamwork for a Quality Education.** 1997 pilot program uses community of teams with minimal faculty supervision. Experiment unleashes students, but is not sustainable due to timing & support. Foreshadows successful, sustained work in iFoundry in 2009. <http://bit.ly/19HDf7Y>
- Engineering & Technology Studies at Illinois (ETSI).** 2006 blogpost (<http://bit.ly/19CfKAv>) wondering why there isn't a philosophy of engineering leads to unlikely chain of events that establishes an interdisciplinary seminar series and network of faculty in arts, sciences, engineering, humanities, and social sciences. Core group ends up participating in iFoundry. ETSI sponsors first *Engineer of the Future* meeting at Illinois in 2007, which leads to first contact between UIUC and Olin faculty.

Workshop on Philosophy & Engineering (WPE). 2006 blogpost also leads to the establishment of series of workshops (Workshop on Philosophy & Engineering in 2007 & 2008), renamed the Forum on Philosophy, Engineering & Technology (fPET) in 2010 & 2012. Conceptual clarity & philosophical rigor become hallmarks of iFoundry reform and transformation efforts. www.philengtech.org

Illinois Foundry for Innovation in Engineering Education (iFoundry). 2007 proposal writing meeting with Andreas Cangellaris at UIUC for a possible NSF Engineering Research Center leads to a question: Why we don't teach our regular students the innovation skills being suggested for the educational component of the ERC? Inquiry to Dean leads to his suggestion for us to write charge for a new ad-hoc committee. Notion of committee is rejected, and the idea of a pilot plant/incubator is put forward, instead. iFoundry whitepaper is written & co-founders (A. Cangellaris & D. Goldberg) assemble five associate department heads (of 13), student leaders, and gung-ho faculty to establish *Illinois Foundry for Tech Vision and Leadership*, later renamed *Illinois Foundry for Innovation in Engineering Education* in 2008 when the activity becomes College of Engineering initiative with small budget.

In 2008, iFoundry launches culture-changing workshops, web page, YouTube videos and in 2009 admits 73 freshmen as part of a small-footprint pilot. Course is believed too small to have much effect, but by midterm students are unleashed and expressing confidence in themselves and their decision to become engineers. This surprise result is puzzling and presented to OIP colleagues at Illinois. Both conclude that unleashing is similar to the "Olin effect," but result was obtained at very low cost, with students providing much of the initiative for the effort. Unleashing students through the triple as follows becomes priority of iFoundry efforts: (1) faculty trust students, (2) students believe they are trusted, and (3) students gain courage & take initiative.

iFoundry continues to be visited by schools & faculty around the world looking to transform large research-oriented schools, especially from Singapore and Brazil. iFoundry efforts continue with program to scale up change using intrinsic motivation course conversion, noticing, listening & questioning training for faculty and teaching assistants. Continue as co-PI on the NSF IM conversion project and continue as advisor to iFoundry efforts since leaving UIUC in December 2010. www.ifoundry.illinois.edu

Olin-Illinois Partnership. During February 2008 visit to Franklin W. Olin College of Engineering as part of UIUC course on *Designing the Engineering Curriculum of the Future*, suggest to Olin VP of Academic Affairs possibility of partnering with Illinois to scale up innovations at Olin to large public research university. VP agrees, saying that Olin was founded as "a Beacon" to engineering education. Olin and Illinois sign MOU in September 2008 at about same time iFoundry becomes official college activity. OIP organizes 2009 & 2010 Engineer of the Future meetings Needham and Champaign, respectively, and agreement for Olin-Illinois student exchange is put into place in 2010.

Coaching & ThreeJoy. Success of transformation efforts Illinois in 2009, together with bad fiscal situation at UIUC, suggests possible career change. Hire executive coach to sort through options, and power of coach's listening and questioning skills leads to (1) early retirement from the University, (2) start of a consulting firm for transforming engineering education (ThreeJoy), and (3) training as a leadership coach at Georgetown University. This latter training is single most transformative experience of adult life, and leads to use of coaching as tool for organizational development and as model for deep faculty development training. Coaching practice continues one-on-one with academic and non-academics, both. Clients regular achieve greater happiness through increases in both productivity and peacefulness. Increasingly offer team training, facilitation & coaching to help academic committees transform to higher performance teams.

National University of Singapore DCC. One of the schools that visited iFoundry was NUS, and in January 2011 accepted visiting part-time position at NUS to help Dean Chan Eng Soon develop his *Design Centric Curriculum*. One challenge of these efforts was to get faculty in hierarchical culture to trust their students. Developed weeklong training program including personal and organizational change basics, and this coursework is credited with positive program outcomes and effective student unleashing. Some of this early training sessions received test at both UIUC and TUDelft.

Work at NUS continues with new plans for a joint program between the Faculty of Engineering and Tembusu College, a liberal arts residential college modeled after Yale/Cambridge. Have worked on undergraduate, graduate student, and faculty training in personal/organizational change basics. Have facilitated team meetings, and programmatic improvement, using a variety of organizational development tools and methods.

While in Singapore, have worked with other programs, including University of Glasgow, Singapore Polytechnic, and Ngee Ann Polytechnic on a variety of faculty, administrator, and student training programs. As example, the use of story reframing methods with Polytechnic students led to closer relations between students and faculty members as well as reframing of student stories to be better

positioned for academic and career success.

Universidade Federal de Minas Gerais. After visits to iFoundry from Insper & UFMG, keynoted a Brazilian Engineer of the Future meeting with Rick Miller, President of Olin College, in Belo Horizonte, Brazil in 2011. Returned the next year to help kick off a major change effort in the Faculty of Engineering at UFMG, now called ENG 200. The training at NUS was adapted to provide a crash course to UFMG faculty, staff, and students. The explicit use of students in this effort was especially important to their early and continuing success as it built upon strong infrastructure of quasi-independent student enterprises run under rubric of Brasil Junior (Junior Enterprise).

Work elsewhere in Brazil and South America, including onsite workshop at Unicamp with faculty members from ITA, Unicamp, and Universidade Federale de Itajubá under auspices of LASPAU at Harvard, doing both a general audience seminar as well as small workshops with faculty engaged in change. Have also done an online lecture for Universidad Tecnica Federico Santa Maria in Chileas for LASPAU.

Founding of Big Beacon. While leaving a Starbucks in Arlington, VA in May 2010, felt strong body shiver five times consecutively, and simultaneously had vision of the Big Beacon as a social movement to transform engineering education. Drafted a powerpoint to outline vision and core components. Approached Mark Somerville at Olin College about continuing previous OIP collaboration under auspices of the Big Beacon. Name is derived from Olin College's mission as "a beacon" to engineering education. A thought leadership consultant was hired in January 2012 and early efforts of BB have focused on thought leadership through writing the Big Beacon Manifesto, regular contributions to the Huffington Post, and a variety of social media outreach efforts on blogs, Twitter, and Facebook. In 2012, Big Beacon and Olin College signed a memorandum of understanding, and Olin is formerly acknowledged as the Founding Beacon.

Writing the BB manifesto and a book. Key early activities for Big Beacon were (1) to write an internet style manifesto and (2) a book. After studying dozens of exemplars of the genre, a manifesto was drafted calling for (a) a whole new engineer, (b) a whole new engineering education, (c) and educational rewire. Karen Salmansohn, (notsalmon.com) was engaged to make the graphics of the manifesto engaging and to create motivational posters. A hallmark of the document is to move away from the hyper-rational language of educational reform and explicitly recognize that transformation of education is fundamentally a cultural and emotional undertaking.

Hired a professional writer to work with Mark and me to craft a book of stories entitled *A Whole New Engineer: A Surprising Emotional Journey* about what happened at Olin, iFoundry, and elsewhere that engaging change has taken place. The writing has led to a deeper understanding of how educational transformation is about core values such as joy, courage, trust, openness, and connection, and how transformation is an urgent matter that can draw on and apply well grounded bodies of work in a variety of fields. A global tour in 2014 and 2015 is planned to use the book as a change artifact and have a deep conversation about where engineering and engineering education is and should be headed.

Mastering the Leadership, Organizational, and Emotional Challenges of a Career in Teaching and/or Research. In Spring 2013, worked with 51 PhD students at Politecnico di Milano at a residential course in Piacenza, Italy. Piloted training these professors of the future with NLQ and other deep faculty development skills. Course was very well received, and subsets of the material were repeated at NUS with PhD students as well.

Facilitating Change that Sticks: Becoming an Effective Change Agent. Took learning from iFoundry & ThreeJoy experience and worked with Mark Somerville at Olin to create 3-day workshop to train educators in both personal change and organizational change. This course was started in 2012 and run again this year. Attendees included faculty members, department heads, associate deans and deans as well as university presidents and deputy presidents. Attendees were concentrated in Europe, Asia, and Central & South America.