

Curriculum Vitae  
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## Seeking Clients & Collaborators Who Want...

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- **Deeply thoughtful & effective educational transformation.** Call forth a 21<sup>st</sup>-century higher education with emotional intelligence, cultural integrity, and epistemological alignment with practice in the real world.
- **Rigorous shift (don't-call-them-soft) skills that supercharge educational practice & change.** Combine the the deep noticing, listening & questioning (NLQ) of an executive coach, the storytelling & reframing of a playwright, the piercing problem-solving of an engineer, and the heart and presence of a counselor or cleric.
- **Persuasive communication that impacts organizations & transcends borders.** Draw from communication experience ranging from books and publications that start new fields of AI to radio programs that call forth global transformation, from messages that conjure emotional-cultural-intellectual change quickly and well to riveting talks and workshops that change hearts then minds.
- **Reflective horsepower that is equally adept in quantitative & qualitative distinctions.** Tap into reflection from the mathematical, computational, and empirical quarters of AI and fluid mechanics to the qualitative, emotional, and embodied jurisdictions of education reform and philosophy of engineering and technology.
- **Courageous coaching that asks about and listens to what can no longer remain silent.** Experience elite coach training and practice informed by a reflective life as an academic, entrepreneur, and transformer.
- **Principled change leadership re-engineered for educational organizations.** Use proven methods from the private sector reworked to promote rapid, effective educational change without tears or revolt.

## 3 Miscalculations of the Modern University + 2 Visions

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**Miscalculation #1—Malpractice in the Education of Practitioners.** “Technical rationality” (TR) assumes practice is merely the application of disciplinary knowledge in particular situations. Practice is more often “conversation-in-action” (CIA), but conversational skills are ignored & maligned as soft skills.

**Revision.** Highlight this *knowing* gap in educational practice, & balance with (a) a return to humanities taught as dialectic, and (b) the introduction of a rigorous basis set of 5+1 CIA skills in practical disciplines.

**Miscalculation #2—Mind over Heart & Body.** Technical rationality also elevates reason over emotional intelligence and embodied knowing, as does the current practice of engineering problem-solving, which results in unintended consequences and follow-on new problems stemming from the “solution.”

**Revision.** Balance current practice with faculty trained as holistic coaches (mentor-coaches) and students taught in a pluralistic culture of noticing, listening, and questioning (NLQ).

**Miscalculation #3—Reform Starts & Ends with Content, Curriculum & Pedagogy.** Educational reform efforts start with attempts to reform content, curriculum, or pedagogy. Unfortunately, the difficulties of the status quo are largely cultural in nature, and merely tweaking artifacts of culture does not affect the espoused values and deep assumptions that continue the broken culture unabated. **Revision.**

Recognize that culture is the locus of change, build stories and skills to shift culture, and pilot prototypes of new culture in an incubator-accelerator using little bets followed by buy-in and scale-up.

**A Dystopian Vision: The University Zombie Apocalypse.** Universities continue to ignore diminishing returns to expertise and become walking-dead institutions weakly supported by stubborn governments and shrinking endowments. Digital natives raised on ubiquitous choice choose to leave and industry joins them in using new educational models that close the growing skills gap of a networked and AI era.

**A Vision of Rapid, Effective Renewal: 4 Sprints & 4 Spirits of Change.** Universities stop talking about the same list of changes that they have been unable to make for decades and figure out that the key is not a matter of *what* but rather a matter of *how*. They adopt elements of modern action frameworks (agile methods, design thinking, and deep shift skills) embedded in ThreeJoy’s revolutionary *4 Sprints Method* and learn how to use the *4 Spirits of Change* (culture, motivation, student futures, and polarities) to align with the world their graduates now face.

## Education & Certification

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**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.

**Professional Engineer**, Pennsylvania, PEO29588E, 1980-present.

**Other recent continuing education.** Jamey Aebersold Jazz Camp, 2018, Fundamental of Jazz Guitar Improvisation, Greg O'Rourke, 2017, Team Coaching & Human Dynamics, One21Live/MiroGroup, 2013; Negotiation & Leadership, Harvard Program on Negotiation, 2012; Drawing on the Right Side of the Brain, Brian Bomeisler, 2011.

## Experience

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**Big Beacon**, President & Founder of 501(c3) non-profit to transform engineering education and higher education more generally, Douglas, MI, [www.bigbeacon.org](http://www.bigbeacon.org), January 2012-present.

**ThreeJoy Associates**, President & Head Coach of training, coaching & transformation facilitation firm, Douglas, MI, [www.threejoy.com](http://www.threejoy.com), May 2010-present.

**Media Host & Contributor**, Big Beacon Radio, Transforming Higher Education.

[www.voiceamerica.com/show/2454/big-beacon-radio](http://www.voiceamerica.com/show/2454/big-beacon-radio), April 2015-2018; Contributor, Huffington Post, [www.huffingtointpost.com/david-goldberg](http://www.huffingtointpost.com/david-goldberg), June 2012-2018.

**National University of Singapore**, Distinguished Visiting Professor, Design-Centric Curriculum, Faculty of Engineering & Tembusu College, National University of Singapore, 2 months per year, 2010-2013.

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

**University of Illinois at Urbana-Champaign**, Co-director & co-founder, Illinois Foundry for Innovation in Engineering Education (iFoundry), 2007-2010, advisor, 2011-2015; Assistant Dean, 1993-1994, College of Engineering; Professor, School of Labor and Employment Relations (25% appointment), Taught Understanding Engineers to Masters in Human Resources and Industrial Relations students, 2009-2010; Jerry S. Dobrovolsky Distinguished Professor in Entrepreneurial Engineering, 2003-2010 (emeritus status granted 2011), Professor 1993-2010, Associate Professor (entered with tenure), 1990-1993, Industrial & Enterprise Systems Engineering (formerly General Engineering); Departmental Affiliate, Department of Computer Science (0% appointment), 2005-2010.

**Key entrepreneurial experience**, Co-Founder & Chief Scientist, [www.sharethis.com](http://www.sharethis.com) (formerly Nextumi, Inc.), 2004-2010; Consultant (with options), Schema, LTD (acquired by teoco.com 2012). Led genetic algorithm improvement initiative in Urbana, IL for Israeli cellphone software firm, 2002-2004.

**University of Alabama**, Associate Professor (with tenure), 1987-1990, Assistant Professor, 1984-1987, Department of Engineering Mechanics, University of Alabama.

**Other Visiting Professorships**, Graduate School of Systems Management, Tsukuba University, Tokyo, December 1999, Medical Informatics, Stanford, Spring 1998; University of Dortmund, Fall 1997.

**University of Michigan**, Lecturer, 1983. Research-Teaching Assistant, University of Michigan, 1975-1976, 1980-1983, Department of Civil Engineering, University of Michigan.

**Stoner Associates** (now Synergi Software), Project engineer and marketing manager. Built engineering software customer support and sales, enhanced software, and led market expansion efforts. Company grows from 2 to 13 engineers, Carlisle, PA, 1976-1980.

**Military experience**, Engineman, US Coast Guard Reserve, Basic training, Engineman School, Shipboard service, USCGC Unimak, Small boat patrols, St Clair Shores CG Station, 1973-1979.

**Summer experiences**, Drafting intern, Fruehauf Corporation, Detroit, MI, 1972; Construction intern, Townsend & Bottum, Inc., Bruce Mansfield Power Plant, Shippingport, PA, 1974; Hydrologist, US Geological Survey, Initial coding resulting in BRANCH open channel code, Reston, VA, 1975.

## Seven Most Influential Publications (bold citation counts from Google Scholar)

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Goldberg, D. E. (1989). *Genetic algorithms in search, optimization, and machine learning*. Reading, MA: Addison-Wesley. **87,658**

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. **3,265**

Goldberg, D. E., & Deb, K (1991). A comparative analysis of selection schemes used in genetic algorithms. *Foundations of Genetic Algorithms*, 1, 69-93 (1991). **2,973**

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. **2,944**

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. **1,926**

Goldberg, D. E., Korb, B., & Deb, K. (1989). Messy genetic algorithms: Motivation, analysis, and first results. *Complex Systems*, 3, 493-530. **1,734**

Goldberg, D. E. (2002). *The design of innovation: Lessons from and for competent genetic algorithms*. Boston, MA: Kluwer Academic. **1,462**  
List of publications available on Google scholar: <http://bit.ly/17litKr>.

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## Nine Publications Related to Educational & Organizational Transformation

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- Goldberg, D. E. (2006). *The entrepreneurial engineer*. Hoboken, NJ: Wiley.
- 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. (2012). Singaporean students can do X. *Innovation: The Singapore Magazine of Technology, Research, and Education*, 11(1), <http://bit.ly/SkzspR>
- Goldberg, D. E., Cangelaris, 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. (2014). *A whole new engineer: The coming revolution in engineering education*. Douglas, MI: ThreeJoy Associates. (with Catherine Whitney) <http://bit.ly/2AbrlR5>
- Somerville, M. & Goldberg, D. E. (24 August 2012). A different kind of diversity: The changing face of engineering education. *Huffington Post*, <http://huff.to/XpdIYB>.

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## Publications Summary

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- Authored or co-authored over 450 publications, of which over 300 were refereed.
- 1989 book in top ten CS citations. Authored or co-authored 4 original books & 1 revised edition.
- **146k+ citations** & h-index **h = 103** according to Google Scholar (h is # of papers with h citations or more).
- Edited or co-edited 7 conference proceedings volumes & 2 special editions of scholarly journals.
- Authored or supervised over 58 computer codes & platforms; 7 patents issued.

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## Eight High-Impact Graduate Students

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- Karr, C. L. (1989). Known as pioneer of the **application of genetic algorithms to fuzzy control** and currently Dean of Engineering, University of Alabama, Tuscaloosa. **h=28**
- Deb, K. (1991). Pioneer in **evolutionary multiobjective optimization** (EMO), and 2005 recipient of Bhatnagar Prize; currently Koenig Endowed Chair, Michigan State University. **h=113**
- Kargupta, H. (1995). Known for **distributed data mining**, 2001 recipient NSF CAREER award winner and co-founder of Agnik, LLC; Currently, President of Agnik. **h=48**
- Harik, G (1997). Was **employee #9 at Google**; currently venture capitalist in Silicon Valley. **h=38**
- Cantu-Paz, E. (1999). Known for **parallel genetic algorithms**; currently Senior Manager, Search Relevance, A9/Amazon **h=36**
- Pelikan, M. (2002). Inventor of **hierarchical Bayesian optimization algorithm**; 2005 recipient of NSF CAREER award; currently Software Engineer at Google. **h=42**
- Butz, M. V. (2004). Known for **anticipatory learning systems**; 2007 recipient of Emma Noether Award (Germany); currently Chair of Cognitive Modeling, Tübingen University. **h=38**
- Sastry, K (2007). Known for **genetic algorithm efficiency enhancement**, winner Intel Achievement Award (2010); currently software engineer (R&D) at Intel. **h=42**
- Summary:** Have advised or co-advised 20 PhD dissertations and 21 MS theses.

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## Honor and Award Highlights

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- Distinguished Academic Partner**, Franklin W. Olin College of Engineering, 2012-2014
- 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

## Stories of Client-Collaborator Success in Personal & Organizational Transformation

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**Founding of Olin-Illinois Partnership (OIP).** Without authority, suggested partnership of David (Olin) and Goliath (Illinois) on first visit to Olin in 2008. Olin and Illinois sign MOU in September 2008 at same time iFoundry becomes official UIUC College of Engineering activity. OIP organizes 2009 & 2010 Engineer of the Future meetings in Needham and Champaign, respectively, and agreement for Olin-Illinois student exchange is put into place in 2010. 2009 iFoundry freshman experience (iEFX) leads to unleashing of Illinois students similar to Olin students (the so-called Olin Effect), which helps both schools understand role of unleashing and culture in change. **Bottom line.** Partnership leads to successful nomination of Olin for 2013 NAE Gordon Prize. UIUC Dean gets promoted to Provost, Associate Dean to Associate Provost, iFoundry co-founder to UIUC Dean of Engineering & subsequently, UIUC Provost.

**DCC Program at NUS.** In January 2011, accepted part-time visiting position at the National University of Singapore (NUS) to help Dean Chan Eng Soon develop his Design Centric Curriculum program. One challenge of these efforts was to get faculty in hierarchical culture to trust their students. Developed weeklong NLQ training program modeled after executive coach training, including personal and organizational change basics, and this coursework is credited with positive program outcomes and effective student unleashing. Work at NUS continued in faculty-student coaching-mentoring program in Tembusu College, a liberal arts residential college modeled after Yale/Cambridge. **Bottom line.** Normally “shy” Singaporean freshmen invite Minister of Education to witness their program presentations and he accepts!! Claims that Singapore needs more of this kind of thing. Dean Chan and his lieutenant move to the Provost’s office, and Tembusu faculty member takes training as a coach to spread her learning around the globe.

**ENG 200 at UFMG.** After visits to iFoundry from Associate Dean Alessandro Moreira of UFMG, DEG keynotes an *Engineer of the Future* summit in Belo Horizonte, Brazil in 2011, discussing role of love in engineering education. Returned next year to help kick off a major change effort in the Faculty of Engineering, now called ENG 200. NLQ training provided to cohort of students, faculty, and staff. Students are unleashed to quickly bring about *Engenharia Recebe* program (Engineering Welcomes You) and other innovations. Returned in 2015 for refresher *Engineer of the Future* meeting/workshop. **Bottom line.** ENG 200 continues to promote change successfully as student-led change effort, and Alessandro Moreira is promoted to Dean by popular vote of his faculty. His success as Dean leads to election to be UFMG Vice-Rector.

### 3 Short Stories

**Case 1**—Director of intellectual property at major public university coaches through insecurities as leader and authentically leads group to improved bottom line and recognition. **Bottom line.** Gets hired at one of top tech universities on planet for enlarged duties and portfolio.

**Case 2**—Associate Professor in Civil Engineering is having trouble sorting through conflicting advice regarding promotion and tenure and is tempted to leave work she loves for work advocated by her peers. **Bottom line.** Coaches through the conflicting advice and does it her way, gaining promotion to full prof and a surprise transfer to a unit better aligned with her work. Returns to coaching to help frame inaugural talk and kind of professor she wants to be.

**Case 3**—Disparate group of transforming schools are having difficulty finding common ground in changes needed now. Through collaborative network organized by Big Beacon, help group design and execute an *Educational Transformers Unconference* (ETU2017) that gives attendees experiential boot camp that results in an exemplar of the higher education culture of the future in just 2.5 days. **Bottom line.** Individual members return to their campuses to apply these pungent lessons to help accelerate change in their schools.

**Let’s talk** if you want results like these. **Sign up** for a meeting at [MeetWithDaveGoldberg.com](http://MeetWithDaveGoldberg.com) today!