

## Biographical Sketch

### **Larry Leifer, Ph.D.**

Professor **Leifer's** formal academic training was obtained at Stanford University. He holds a Bachelor of Science degree in Mechanical Engineering (BS'62), a Master of Science degree in Product Design (MS'63) and a PhD'69. in Biomedical Engineering – Neuroscience. From 1969-1973 his research included electrophysiological (EEG and EMG) measures of human information processing during flight simulation at the NASA Ames Research Center and the MIT Man-Vehicle Laboratory. He was an Assistant Professor of Biomedical Systems Analysis at the Swiss Federal Institute of Technology in Zurich, Switzerland, prior to joining the faculty at Stanford University in 1976. He presently teaches Mechanical Engineering 310, a high-tech, globally distributed graduate course in "Product-Based Engineering Design, Innovation, and Development with Corporate Partners;" the Design Theory and Methodology seminar; and a freshman seminar, "Designing the Human Experience."

He is founding director of the Stanford Center for Design Research (CDR'84) where he works with colleagues in AA, ME, CEE, CS, MSE, Medicine and the Humanities to understand and facilitate creative technical design-team activity. He is developing objective measures of design team performance (learning) under various structured methodology conditions using a variety of computational tools. These studies are focused on globally distributed product design-development teams on campus, across internationally distributed campuses, and with global industries. Based in part on the results of this experimental approach to curriculum reform, Professor Leifer was founding director of the Stanford Learning Laboratory (1997-2001), an initiative by then Stanford President Gerhard Casper to systematically improve learning through judicious use of information and communication technology. He is a founding member of the Hasso Plattner Institute of Design at Stanford (**d.school**), an initiative lead by Professor David Kelley (co-Founder of IDEO Product Development). Professor Leifer is the Stanford Director of the Hasso Plattner Design Thinking Research Program in partnership with the Hasso Plattner Institute, Potsdam, Germany.

In an effort to develop and disseminate assistive device technology, he was founding director of the Department of Veterans Affairs Stanford Rehabilitation Engineering R&D Center (1978-1989). He co-founded the Tolfa Corporation (1989-)(now Lingraphicare America) and Independence Works, Inc. (1992-2002).

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## Identity

Name: Larry John Leifer  
Born: 2 July 1940  
Title: Professor, Mechanical Engineering Design, Stanford University  
Family: Spouse, 5 children

## Education

1958-62 B.S., Engineering Science, Stanford University  
1963-63 M.S., Mechanical Engineering Product Design, Stanford University  
1964-69 Ph.D., Biomedical Engineering (Neuroscience), Stanford University

## Employment

1963-64 Research Assistant, Mech. Engr., Stanford University  
1964-69 NIH pre-doc Fellow, Biomed. Engr., Stanford University  
1970-71 NAS post-doc Fellow, Biomed. Engr., NASA Ames Research Center  
1972-73 NASA exchange Fellow, Aero. Astro., MIT  
1974-76 Assistant Professor, Biomed. Engr., Swiss Federal Institute of Technology Zurich (ETHZ)  
1977-88 Associate Professor, Mech. Engr., Stanford University  
1977-88 Associate Professor, Biomed. Engr., Neurology, by courtesy  
1978-88 Founding Director, Stanford Smart Product Design Lab  
1979-89 Founding Director, Stanford-VA Rehabilitation R&D Center  
1984- Founding Director, Stanford Center for Design Research  
1988- Professor, Mech. Engr. Design, Stanford University  
1989-91 Co-Founder, CTO, Tolfa Corporation (now Lingraphicare America)  
1992-03 Founder, President, Independence Works, Incorporated  
1996- Faculty Associate, Stanford Center for the Study of Language & Information  
1997-01 Founding Director, Stanford University Learning Laboratory  
2004- Founding Member, Hasso Plattner Institute of Design at Stanford  
2008- Founding co-Director, Hasso Plattner Design Thinking Research Program

## Awards

2011-12 Visiting Professor, Swiss Federal Institute of Technology Zurich (ETHZ), Switzerland  
2011-12 Visiting Professor, University of Saint Gallen (UniSG), Switzerland  
2011 Honorary Fellow, The Design Society, conferred at the International Conference on Engineering Design, Copenhagen, 18 August, 2011  
2009 Hedersdoktor (Honorary Doctorate), Royal Institute of Technology (KTH), Stockholm, conferred at the KTH commencement, Stockholm, 20 November 2009

- 2007 Best Paper Award: Chen, H.L., Cannon, D., Gabrio, J., Leifer, L., Toye, G., and Bailey, T., "Using Wikis and Weblogs to Support Reflective Learning in an Introductory Engineering Design Course," in the proceedings of the ASEE Transactions
- 2007- Honorary Fellow, University of Tokyo, Japan
- 1998 Best Paper Award: Fruchter, R., Reiner, K., Leifer, L., and Toye, G., "VisionManager: A Computer Environment for Design Evolution Capture," CERA: Concurrent Engineering: Research and Application Journal, Vol 6, Nr. 1
- 1997 ASME, Teaching Innovation Award
- 1997 Best Paper Award: Sheppard, S., Johnson, M., and Leifer, L., "A Model for Peer and Student Involvement in Design Course Assessment," Proceedings of the FIE Frontiers in Education Conference, Pittsburgh, November 4-9
- 1965 Pre-Doctoral Fellowship, National Academia of Engineering

## Professional Society Membership

- American Association for the Advancement of Science (AAAS)
- Association for Computing Machinery (ACM)
- American Society for Engineering Education (ASEE)
- American Society of Mechanical Engineers (ASME)
- Computer Engineering Division (CED)
- Design Division (DD)
- Institute of Electrical and Electronic Engineers (IEEE)
- Engineering in Medicine and Biology (EMBS)
- Systems Man and Cybernetics (SMC)
- Rehabilitation Engineering Society of North America (RESNA)
- Design Society (DS)
- International Society of Systems Engineering (ISSE)

## Professional Service

- Chairman, RESNA Special Interest Group on Robotics, 1986-1988
- Editorial Board, ASME-SOMA Engineering the Human Body, 1986-92
- Member, NSF Workshop on Design Theory and Methodology, Oakland, 1987
- Member, VA Site Visit Team, University of Hawaii, Honolulu, 1987
- Member, NSF Materials Data-Base in Design Workshop, Stanford, 1987
- Member, NASA-JPL Workshop on Technology Transfer, Pasadena, 1987
- Member, NASA-JSC, Telerobotics Program Review Team, Houston, 1987
- Co-Chairman, RESNA Conference and Exhibition, San Jose, 1986-1987
- Member, NASA Automation & Robotics in Space Workshop, Wright State Univ., 1988
- Member, Canadian NRC Mobile Robots Site Visit Team, Ottawa, 1988
- Editorial Board, Journal of Assistive Technology, 1988--92
- Member, NSF Workshop on Information Requirements in Design, Atlanta, 1989
- Member, ASME Technical Committee on Design Theory & Methodology, 1989-
- Member, DARPA Workshop on Engineering Design, Ithica, 1990
- Member, NASA Workshop on Conceptual Aircraft Design, ARC, September, 1990

Member, NSF-DARPA Workshop on Information in Engineering Design, Ithica, 1991  
Fellow, NASA-ASEE Summer Fellowship, Ames Research Center, 1992  
Member, ARPA Workshop on Engineering Design, Orlando, 1993  
Member, NSF Workshop on Restructuring Engr. Education, Washington DC, 1994  
Co-organizer, USA-Japan Workshop on Engr.Edu.Evaluation, Semi-ah-moo, 1994  
Member, ARPA, Workshop on Engineering Design, Washington DC, 1994  
Member, AAHA, Workshop on Peer Teaching Assessment, Stanford, 1994  
Organizer, Synthesis Assessment Workshop, Palo Alto, 1994  
Co-organizer, USA-Japan Workshop on Engr.Edu.Evaluation, Osaka, JP, 1995  
Consultant, Tech.Univ.Delft, Curriculum Redesign, Delft, NL, 1995  
Member, AAHA, Workshop on Peer Teaching Assessment, Wash.DC, 1995  
Co-organizer, International Workshop on Problem-Based-Learning, Stanford, 1995  
Co-organizer, International Workshop on Problem-Based-Learning, Aalborg, 1995  
Member, AAHA, Workshop on Peer Teaching Assessment, Wash.DC, 1996  
Member, Univ.Tokyo RACE Program review team, Tokyo, November, 1996  
Member, Univ.Tokyo RACE Program review team, Tokyo, November, 2001  
Member, NAS-NRC Board on Engineering Education, 1997-1999  
Member, Editorial Board, Design Studies, Elsiever Press, 1998-  
Member, NAE-CEE Committee on Engineering Education, 1999-2004  
Chair, International Conference on Engineering Design, Stanford, 2009  
Member, Steering Advisory Board, International Journal of Design Creativity and Innovation (Taylor & Francis), 2012-

## **Courses Taught**

### Undergraduate

Visual Thinking - sketching skill development for conceptual design  
Human Values in Design - an introduction to product design  
Advanced Product Design - need finding  
Advanced Product Design - advanced visualization  
Advanced Product Design - senior project  
Designing the Human Experience: design theory in practice

### Graduate

Project-Based Engineering Design, Innovation, and Development, 3 quarter (30 week) sequence, 10 industry sponsored projects, 10 international academic partners  
Product Design Master's Project - need finding to prototype, 3 quarter sequence  
Introduction to Smart Product Design - microcomputers & electro-mechanics  
Intermediate Smart Product Design - digital logic and real-time systems  
Advanced Smart Product Design - functional integration, a project course  
Design Theory & Methodology - a PhD candidate research seminar  
Neuro-physiological Signal & Data Analysis  
Neuromuscular Control Systems

## Patents (8)

1. Jameson, J., and **Leifer**, L., , “The direct link manipulator glove for space suit applications”  
awarded 1988, U.S. Patent No. 4,756,655

A manipulating mechanism is disclosed having a control handle adapted to be positioned freely in three dimensions, a fixture for supporting a tool to be positioned, a linkage system which causes the end of the tool to move in the same direction as the control handle and a support structure. The linkage system includes a first linkage connected between the control handle and an effective ball-and-socket joint and a second linkage connected between the effective ball and socket joint and the fixture. Each linkage includes four link members rotatably connected in a parallelogram and a gimbal connected to one of the link members for mounting the linkage from the support structure.

2. Steele, R., Gonsalves, R., and **Leifer**, L. “Method of Communicating with a Language Deficient Patient”  
awarded 1992, U.S. Patent No. 5,169,342

An interactive method of communicating with a language deficient user such as an aphasic patient is disclosed. The computer has a display with a pointing device for visually indicating a position through a cursor means on the display. In one example, a plurality of images with each image being a graphical representation of word oriented information or a component thereof is displayed. A plurality of tool-like icons is also displayed. The cursor can be positioned to one of the desired plurality of tool-like icons. When one of the plurality of tool-like icons is selected by the user, the cursor is changed into the image of the tool-like icon selected. The tool-like icon image selected for the cursor is then moved to one of a plurality of the images which represent word-oriented information or a component thereof. When the cursor is activated on the image, a display of information represented by the tool-like icon acting on the word-oriented image is then visually displayed by the computer.

3. Steele, R., Gonsalves, R., and **Leifer**, L.,— dated April 21, 1998. “Method of Communication Using Sized Icons, Text, and Audio”  
awarded 1998, U.S. Patent No. 5,742,779

Language oriented information is communicated to and from a user by the use of a computer with a dynamic graphics display, having a pointing device for visually indicating a position through a cursor on the display. Various embodiments of the method include calling an icon to attention when the cursor is positioned on the icon, auto projecting an icon when it is activated, changing the icon image to denote its terminal node status, varying the play back speed of the audio/visual aspect of an icon, moving among different layers of a hierarchical database, and text searching and matching with icons.

4. Adegboyega Mabogunje, Neeraj Sonalkar, Larry J. Leifer, Shashikant Khandelwal. "United States Patent 9710787 Systems and Methods for Representing, Diagnosing, and Recommending Interaction Sequences", Leland Stanford Junior University, Jul 18, 2017

Systems and methods for representing and diagnosing interaction sequences in accordance with embodiments of the invention are disclosed. In one embodiment of the invention, a group interaction diagnosis and recommendation server system includes a processor and a memory configured to store a set of reference interaction data, where the reference interaction data includes a set of reference interaction sequences, wherein a group interaction diagnosis application configures the processor to obtain a set of group interaction data, generate an interaction model based on the group interaction data and an interaction dynamics language, determine at least one interaction sequence within the set of group interaction data based on the generated interaction model, identify at least one matching interaction sequence within the determined at least one interaction sequence, and recommend at least one improved interaction sequence based on the identified at least one matching interaction sequence and the set of reference interaction data.

5. Toye, G, and **Leifer**, L., "Television Systems Incorporating Separate A/V Processing Systems and Television Displays", awarded 2016, U.S. Patent No. US20160156873

Television systems are disclosed that incorporate separate A/V processing systems and television displays. The television displays can receive video driving signals wirelessly from the A/V processing system that can be used to directly drive the display driver of the television display. By separating the electronics used to receive various input sources of audio and video (A/V) content from the television display, the television display can be designed to consume less power, can be manufactured to be significantly lighter and can be installed with fewer cables. Indeed, cables can be eliminated entirely, where the A/V processing system communicates wirelessly with the television display and the television display obtains power wirelessly from a wireless power supply.

6. Yen, S., Fruchter, R., and **Leifer**, L., 2004, "System and Method for Indexing, Accessing and Retrieving Audio/Video with Concurrent Sketch Activity", awarded 2004, U.S. Patent # 6724918

For a number of users is a system provided to create, edit, replay and view documents of free hand drawn sketches. The system captures the creation process together with verbal and/or visual information provided by each user and automatically correlates them for a later synchronized replay. The system provides a number of tools and features, mainly to: combine the sketching activity with existing images, to selectively retrieve media information correlated to individual sketch entities and to quasi simultaneously collaborate at a common document. The system architecture can be adjusted to various parameters in the communication infrastructure. The system may be implemented in any software program, a web based service, a web browser, an operating system for computers and/or communication devices.

7. Yen, S., Fruchter, R., and **Leifer**, L, “Concurrent Voice to Text and Sketch Processing with Synchronized Replay”, awarded 2008, U.S. Patent [7,458,013\(USA\)](#)

Voice to Text and Sketch (V2TS) is a patented software program which allows text or drawings to be synchronized to recorded audio. Each portion of text or section of a drawing is associated with an audio segment recorded at the time it was written/sketched. Using V2TS, a user can replay dialogue and audio that occurred when a certain note or sketch feature was created in a meeting, class or creative session. V2TS also indexes phrases, allowing users to find relevant sections of audio stream to be replayed along with synchronized sketch content. This technology is particularly useful for knowledge transfer in collaborative design projects or online learning.

8. Atsushi, H., Cannon, D. and **Leifer**, L., “Design process recording method and a design process recorder” awarded 1998, U.S. Patent # 5784286A

The design process recorder of the invention includes a data collector for inputting a query; a data storage and management unit for storing a design record including a plurality of nodes and a plurality of arcs, one of the plurality of nodes corresponding to design information; and a story teller for tracing back and forth the nodes and the arcs from a node indicated by the query, and for presenting design information related to a traced node as a story-board.



## Books and Chapters (38) (first author alphabetical order)

1. Baya, V. and **Leifer**, L.J. (1996). "Understanding Information Management in Conceptual Design," in Dorst, K., H.Christiaans and N. Cross (Eds.), *Analyzing Design Activity*, Wiley, Chichester, UK, 1996
2. Brereton, M.F., Cannon, D.M., Mabogunje, A., and **Leifer**, L. (1996). "Characteristics of Collaboration in Engineering Design Teams: Mediating Design Progress through Social Interaction," in Dorst, K., H.Christiaans and N. Cross (Eds.), *Analyzing Design Activity*, Wiley, Chichester, UK, 1996
3. Chen, H.L., Cannon, D., Gabrio, J., **Leifer**, L., Toye, G., and Bailey, T. (2005), Using Wikis and Weblogs to Support Reflective Learning in an Introductory Engineering Design Course (pp.95-105), in J.S. Gero & U. Lindemann (Eds.), *Human Behavior in Design'05*, Key Centre of Design Computing and Cognition, University of Sydney.
4. Currano B., Steinert M., **Leifer** L. (2011): *Design Loupes: A bifocal study to improve the management of engineering design innovation by co-evaluation of the design process and information sharing activity*; In Plattner H., Meinel C., **Leifer** L. (to be published 2011): *Design Thinking Research - Studying Co-Creation in Practice*, pages 91-107, Springer, ISBN 978-3-642-21642-8 (USA).
5. Dorfman, L., Cummins, K., and **Leifer**, L. (1981) editors, "Distributions of Conduction Velocity: A Population Approach to the Electrophysiology of Nerves," Allen Liss, Inc., New York, 1981, 311 pages
6. Edelman, Jonathan, Avantika Agarwal, Cole Paterson, Sophia Mark, and Larry **Leifer** "Understanding Radical Breaks" in **Studying Co-Creation in Practice**, Springer Berlin Heidelberg New York, 2012.
7. Eris, O., and **Leifer**, L. (2004). "Modeling Product Development Knowledge Acquisition in Industry," in *The Role of Empirical Studies in Understanding and Supporting Engineering Design*, Subrahmanian, Sriram R., Herder P (editors), Delft University Press, 2004.
8. Eris, O., Bergner, D., Jung, M., **Leifer**, L. (2006). "ConExSIR: A Dialogue-based Framework of Design Team Thinking and Discovery" in *Chance Discoveries in Real World Decision Making*, Ohsawa, Y., Tsumoto, S. (editors), p. 329-344, Springer-Verlag, London, 2006.
9. Eris, Ozgur, David Bergner, Malte Jung, and Larry **Leifer**. 2006. "ConExSIR: A Dialoguebased Framework of Design Team Thinking and Discovery." In *Chance Discoveries in Real World Decision Making*, ed. Yukio Ohsawa and Shusaku Tsumoto, 30:329–344. *Studies in Computational Intelligence*. Springer Berlin / Heidelberg. <http://www.springerlink.com/content/406312214438x54q/abstract/>.
10. Ju, W., Aquino Schluzas, L., **Leifer**, L. (2014). "People with a Paradigm: The Center for Design Research's Contributions to Practice." In Chakrabarti, A., & Lindemann, U. *Impact of Design Research on Practice*.
11. **Leifer** L., Skogstad P., Seering W. (eds.) (2009: *Proceedings of ICED'09, Volume 6, Design Methods and Tools*, p.473-484, The Design Society, ISBN 978-1904670100 (USA).
12. **Leifer** L., Steinert M. (2011): "Dancing with Ambiguity: causality behavior, design thinking, and triple-loop-learning"; in Rouse, W.B., Boff, K.R., Sanderson, P. (2012): *Complex Socio-Technical Systems, Understanding and Influencing the Causality of Change*; The Tennenbaum Institute Series on Enterprise Systems, ISBN 978-1-61499-081-9, IOSpress (NED)

13. **Leifer, L.** (1969). "Characterization of Muscle Fiber Discharge During Voluntary Isometric Contraction of the Biceps Brachii Muscle in Man," Ph.D. Thesis, Stanford University, University Microfilms, June 1969, 119 pages
14. **Leifer, L.** (1981). "Peripheral Motor Neuron Conduction Velocity Distribution Estimation," in *Distributions of Conduction Velocity: A Population Approach to the Electro-physiology of Nerves*, Allen Liss, Inc., New York, 1981, pp. 233-265
15. **Leifer, L.** (1982). "High Technology, by Design, for the Handicapped," *Technology for Independent Living*, Redden, M., Stern, L., editors, AAAS Press, Washington DC, 1982, pp. 143-157
16. **Leifer, L.** (1982). "Restoration of Motor Function - A Robotics Approach," in *Uses of Computers in Aiding the Disabled*, North-Holland Co., 1982, pp. 3-18
17. **Leifer, L.** (1998). Design team performance: Metrics and the impact of technology. In S. a. C. S. Brown (Ed.), *Evaluating corporate training: Models and issues* (pp. 1-22): Kluwer Academic Publishers.
18. **Leifer, L., Otto, D., Hart, S., and Huff, E.** (1976). "Slow Potential Correlates of Predictive Behavior During a Complex Learning Task," in *Event Related Slow Potentials of the Brain*, McCallum, editor, 1976, pp. 65-70
19. **Leifer, L.J.** (1987). "On the Nature of Design and an Environment for Design," in Rouse, W.B., and Boff, K.R., editors, *System Design: Behavioral Perspectives on Designers, Tools, and Organizations*, North-Holland, pp.199-210, 1987
20. **Leifer, L.J.** (1987). "Prostheses," in Shapiro, S.D., editor in chief, *Encyclopedia of Artificial Intelligence*, Vol.2, John Wiley & Sons, 1987, pp.797-805
21. **Leifer, L.J.** (1998). "Design Team Performance: Metrics and the impact of Technology," in *Evaluating Organizational Training*, Brown, S.M., and Seidner, C., editors, Kluwer Academic Publishers, 1998
22. **Leifer, L.J.** (2005). "Center for Design Research at Stanford University", in "Design Process Improvement - A Review of Current Practice," Clarkson, P. John; Eckert, Claudia (Eds.), In press: publication year 2005, ISBN: 1-85233-701-X, pp 522-526
23. Luebbe, A., Edelman, J., Steinert, M., **Leifer L.**, and Weske, M.. Design thinking implemented in software engineering tools. *8th Design Thinking Research Symposium*, 2010.
24. Lewrick, M., Link, P., and **Leifer, L.** (eds.) (2017). "Das Design Thinking Playbook", Verlag C.H.Beck/Verlag Franz Vahlen, 305 pages in German, (ET 16-02-17), ISBN 978-3-8006-5385-0
25. Meinel, C., and Leifer, L. (eds.) (2018). "Design Thinking Research: Looking Further: Design Thinking Beyond Solutions-Fixation", in the Series: Understanding Innovation, Springer, Vol.9
26. Norell-Bergendahl, M., Grimheden, M., **Leifer, L.**, Skogstad, P., and Seering, W. (eds) (2009). "Proceedings of the ICED'09, Volume 6, Design Methods and Tools, The design Society, ISBN 978-1904670100 (USA)
27. Otto, D., Benignus, V., Ryan, L., and **Leifer, L.** (1975). Slow Potential Components of Stimulus Response and the Preparatory Process in Man -- A Multiple Regression Model, *Cerebral Evoked Potentials in Man*, Desmedt, J., editor, Oxford Press, 1975, pp. 143-157
28. Plattner, H., Meinel, C., and **Leifer, L.** (eds.) (2010). "Design Thinking Research: Understand – Improve – Apply," in the Series: Understanding Innovation, Springer, Vol.1
29. Plattner, H., Meinel, C., and **Leifer, L.** (eds.) (2011). "Design Thinking Research: Studying Co-Creation in Practice," in the Series: Understanding Innovation, Springer, Vol.2

30. Plattner, H., Meinel, C., and **Leifer**, L. (eds.) (2012). "Design Thinking Research: Measuring Performance in the Field" in the Series: Understanding Innovation, Springer, Vol.3
31. Plattner, H., Meinel, C., and **Leifer**, L. (eds.) (2013). "Design Thinking Research: Measuring the Impact of the Curriculum," in the Series: Understanding Innovation, Springer, Vol.4
32. Plattner, H., Meinel, C., and **Leifer**, L. (eds.) (2014). "Design Thinking Research: Building Innovators," in the Series: Understanding Innovation, Springer, Vol.5
33. Plattner, H., Meinel, C., and **Leifer**, L. (eds.) (2015). "Design Thinking Research: Making Design Thinking Foundational," in the Series: Understanding Innovation, Springer, Vol.6
34. Plattner, H., Meinel, C., and **Leifer**, L. (eds.) (2016). "Design Thinking Research: Taking Breakthrough Innovation Home," in the Series: Understanding Innovation, Springer, Vol.7
35. Plattner, H., Meinel, C., and **Leifer**, L. (eds.) (2017). "Design Thinking Research: Making Distinctions: Collaboration versus Cooperation," in the Series: Understanding Innovation, Springer, Vol.8
36. Skogstad, P., and **Leifer**, L.. (2011). "A Unified Innovation Process Model for Engineering Designers and Managers." In *Design Thinking*, ed. Christoph Meinel, Larry Leifer, and Hasso Plattner, 19–43. Understanding Innovation. Springer Berlin Heidelberg.
37. Steinert M., **Leifer** L. (2012): analzeD: A Virtual Design Observatory; in Plattner H., Meinel C., Leifer L., "Understanding Innovation: Design Thinking Research", Springer
38. Tang, J. C. and **Leifer**, L. J. (1996). An Observational Methodology for Studying Group Design Activity, in *Mechanical Design: Theory and Methodology*" edited by Waldron and Waldron, Springer-Verlag, Chapter 5, pp. 52-70, 1996

## Journal Papers (63)

1. Auernhammer J. M. & **Leifer** L., (in review) Organizational Design as Human-centered Design Practice, Conference proceedings Research&Design Management Conference, Design Management Academy, Milano Italy
2. Vetterli, C., Sherrer, C., Aquino Shluzas, L., **Leifer**, L. (2017). Delight by Design als Erfolgsfaktor im Spitalwesen [As a success factor in the hospital sector]. Marketing Review St. Gallen. 1: 2017, pp. 10-16.
3. Adams J., Rogers, B., Hayne, S., Mark G., Nash, J., **Leifer**, L. (2004). "The effect of a telepointer on student performance and preference," Computers & Education, Elsevier, (check web for details : <http://authors.elsevier.com/sd/article/S0360131504000028>)
4. Aquino Shluzas, L., **Leifer**, L.J. (2012). "The Insight-Value-Perception (iVP) model for user-centered design." Submitted for publication in Technovation, Special Issue on Design, DOI: 10.1016/j.technovation.2012.08.002
5. Awad-Edwards, R., Engelhardt, K.G., Van der Loos, H.F.M., **Leifer**, L.J. (1984). "Interactive evaluation of voice control for a robotic aid." AVIOS Journal, 1984.
6. Baya, V. and **Leifer**, L.J. (1996). "Understanding Information Management in Conceptual Design," in Dorst, K., H.Christiaans and N. Cross (Eds.), Analyzing Design Activity, Wiley, Chichester, UK
7. Brenner, W., Karagiannis, D., Kolbe, L., Krüger, J., Lamberti, H. J., **Leifer**, L., Leimeister, J. M., Osterle, H., Petrie, C., Plattner, H., Schwabe, G., Uebornickel, F., Winter, R., & Zarnekow, R. (2014). User, Use & Utility Research: The digital user as new design perspective in Business & Information Systems Engineering. *Business & Information Systems Engineering (BISE)*, 6(1), 55-61, DOI:10.1007/s12599-013-0302-4.
8. Brereton, M.F., Cannon, D.M., Mabogunje, A., and **Leifer**, L. (1996) "Characteristics of Collaboration in Engineering Design Teams: Mediating Design Progress through Social Interaction," in Dorst, K., H.Christiaans and N. Cross (Eds.), Analyzing Design Activity, Wiley, Chichester, UK
9. Carleton, T., & **Leifer**, L. (2009). *Stanford's ME310 Course as an Evolution of Engineering Design*. Paper presented at the 19th CIRP Design Conference – Competitive Design, Cranfield University, UK.
10. Carleton, T., and **Leifer**, L., (2009). *Stanford's ME310 Course as an Evolution of Engineering Design*. Rajkumar Roy, Essam Shehab. <http://hdl.handle.net/1826/3648>
11. Chen, H.L., Cannon, D., Gabrio, J., **Leifer**, L., Teye, G., and Bailey, T. (2005), "Using Wikis and Weblogs to Support Reflective Learning in an Introductory Engineering Design Course," in Gero, J.S., and Lindemann, U. (editors), Human Behavior in Design'05, Key Centre of Design Computing and Cognition, University of Sydney, pp. 95-105, INVITED
12. Currano R., Steinert M., **Leifer** L. (2012): A framework for reflection in innovation design, International Journal of Engineering Education (IJEE), Special Issue on Design Education: Innovation and Entrepreneurship, Volume 28, Number 2, ISSN 1932-2008, TEMPUS Publications. (SJR indicator 2010: 0.031, equivalent index to Thomson citation index of 0.831)
13. Dillier, N., Spillmann, T., Fisch, U.P., and **Leifer**, L. (1980). "Encoding and Decoding of Auditory Signals in Relation to Human Speech and its Applications to Human Cochlear Implants, Audiology, Vol.19, 1980, pp. 48-68
14. Donchin, E., Gerbrandt, L., **Leifer**, L., and Tucker, L. (1972). "Is Contingent Negative Variation Contingent Upon a Motor Response?," Psychophysiology, Vol.9, Nr.2, 1972, pp. 178-188

15. Dym, C.L., Agogino, A.M., Eris, O., Frey, D.D., and **Leifer**, L.J. (2005). "Engineering Design Thinking, Teaching, and Learning," *Journal of Engineering Education*, January 2005, pp. 103-120
16. Edelman, J., Agarwal, A., Paterson, C., Mark, S., and **Leifer**, L. (2012) "Understanding Radical Breaks" in **Studying Co-Creation in Practice**, Springer Berlin Heidelberg New York, 2012.
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16. **Leifer**, L.J., Center for Design Research SIMA Projects, Stanford Institute for Manufacturing and Automation Symposium, June, 1990, 12 pages
17. **Leifer**, L.J., et al, Rehabilitation Research and Development Center Report, Veterans Administration Rehabilitation R&D Progress Reports, June, 1986, 75 pages
18. **Leifer**, L.J., et al, Rehabilitation Research and Development Center Report, Veterans Administration Rehabilitation R&D Progress Report, June 1988, 93 pages
19. **Leifer**, L.J., et al, Rehabilitation Research and Development Center Progress Reports, Journal of Rehabilitation R&D, Spring, 1989, 13 pages
20. **Leifer**, L.J., Synthesis Assessment Implementation Plan, Synthesis Coalition 5th year report, September, 1994
21. **Leifer**, L.J., The Stanford Learning Lab 1997-2000, Stanford University, April 2001

22. Senescu, R., Fischer, M., Steinert, M., Head, A., Schwegler, B., **Leifer**, L. "Leveraging Team-Information Interactions to Reveal Project Workflows" in Measuring and Increasing Productivity of Knowledge Workers, Media X Research Report, January 2012.

## 23. Video Productions (11)

1. **Leifer**, L.J., MADEFAST: a model for internet mediated collaborative research and development, version 1.1 (7 minute video), version 1.2 (10 minute video), March, June 1994
2. **Leifer**, L.J., ME210: a model for corporate university collaboration in product-based-learning, 10 minute video production, September, 1995
3. **Leifer**, L.J., ME210: pedagogy and design process leadership in corporate-university product-based-learning collaboration, 30 minute video production, November, 1996
4. **Leifer**, L.J., Shakespeare on the Web, 20 minute video production covering the design, implementation and review of an experimental distant learning course given by Larry Friedlander (Stanford) and Pete McDonalson (MIT) with Larry **Leifer** and CDR providing distant collaboration technology and experience, August 1996
5. **Leifer**, L.J., Atman, C., Olds, B., and Miller, R., invited video broadcast, "Innovative Assessment Opportunities," National Technical University, Fort Collins Colorado, 1 hour satellite broadcast, approximately 1200 subscribers at 47 sites, 60 minute instruction video on engineering education assessment methodology, November 1996
6. **Leifer**, L.J., ME210: an experience in Product-Based-Learning, 51 minutes video production documenting the experiences of 3 design-teams during the 1995-1996 academic year in ME210, November, 1996
7. **Leifer**, L.J., Beyond Words: an introduction to the Humanities, 6 minute summary, produced by SCPD-MVP, Larry **Leifer**, host-author, Larry Friedlander, Tim Lenoir and Hans Saucey co-authors and course faculty.
8. **Leifer**, L.J., Beyond Words: an introduction to the Humanities, 36 minute documentary, produced by SCPD-MVP, Larry **Leifer**, host-author, Larry Friedlander, Tim Lenoir and Hans Saucey co-authors and course faculty.
9. **Leifer**, L.J., me310 "Team Based Design Development with Corporate Partners," 9 minute version, VHS conversion to DVD for digital distribution to Design Affiliate program members
10. **Leifer**, L.J., me310 "An Experience in Team Based Design Development with Corporate Partners," 49 minute version, VHS conversion to DVD for digital distribution to Design Affiliate program members
11. **Leifer**, L.J., Global Teams: Learning, Culture, and Innovative Design," 18 minute documentary on ME110K, a design course taught at the Stanford Japan Center in Kyoto, Japan; Tamsin Orion (SCPD/Stanford MediaWorks), producer and co-author; Melissa Peabody, editor; David Cannon, course instructor and co-author; Larry **Leifer**, course faculty supervisor



## **Current Grants (9)**

1. NSF collaborative Research Mapping High-Performance Design Team “Genome”
2. Ford: Car Rx: Transforming Vehicle Interiors into a Therapeutic Hub
3. Ford: Socially Acceptable Motion for Pedestrian Assistive Devices
4. Bosch: HMI for Automated Driving
5. Toyota: Understanding Driver State in Laboratory and Naturalistic Environments
6. Toyota: Individual Driving Styles: Learning, Modeling, and Improving Driver Safety
7. HPDTRP: The Time Capsule: Transferring Design Knowledge Across Temporal Team-of-Teams
8. DB Systel: Organizational Design and Team Coaching for Creating High-Performance Self-Organizing Teams
9. Ford: Shared Control in Driver Vehicle Automation

## Invited Lectures, Workshops, Reviews (350+)

Just plain too many to list and averaging 10+ keynote talk invitations per year.

## Doctoral Students Graduated (63 as of October 2018)

1. **Adams**, Jesse David, **PhD**, ME, Stanford University, June 2001, "The transfer of scanning probe microscope research to the university classroom: Lessons in distributed collaboration."
2. **Aldaz**, Gabriel, **PhD**, Stanford University, 2015, "Smartphone-based system for learning and inferring hearing aid settings"
3. **Aquino-Shluzas**, Lauren Marie, **PhD**, ME, Stanford University, May 2011, "The Influence of Design and Development Practices on Outcomes: a case-based analysis of medical device design."
4. **Baya**, Vinod, **PhD**, ME Stanford University, June 1997, "Information handling behavior of designers during conceptual design: Three experiments."
5. **Brereton**, Margot, **PhD**, ME Stanford University, June 1999, "The role of hardware in learning engineering fundamentals: An empirical study of engineering design and product analysis activity".
6. **Brown**, Donald ME, Stanford University, June, 1988, "Knowledge Based Engineering Analysis". Don is now an Associate Professor of Mechanical Engineering at the University of Utah.
7. **Buckley**, Charles, **PhD**, ME, Stanford University, August, 1985, "The Application of Continuum Methods to Path Planning". Chuck then worked on VLSI design topography in the Informatics Department at the Swiss Federal Institute of Technology, Zurich, Switzerland. He is now an independent consultant in Palo Alto, California.
8. **Cannon**, David J., **PhD**, ME, Stanford University, June, 1992, "Point-and-Direct Telerobotics: object level strategic supervisory control in unstructured interactive human-machine environments."
9. **Cannon**, David M., **PhD**, ME, Stanford University, June, 2018, "Prediction of design team performance through analysis of language use in meetings."
10. **Carleton**, Tamara, **PhD**, ME, Stanford University, October, 2010, "The Role of Vision in Radical Technological Innovation."
11. **Carrillo**, Andrew, **PhD**, ME, Stanford University, 2002, "Engineering Design Team Performance: quantitative evidence that membership diversity effects are time dependent."
12. **Choi**, Won Yon, **PhD**, ME, Stanford University, 1993, "Contingency-Tolerant Motion Planning and Control: a combinatorial approach using global planning and local control". Won Yon is working in his native Korea.
13. **Cockayne**, William, **PhD**, ME, Stanford University, 2004, "A Study of the Formation of Innovation Ideas in Informal Networks."
14. **Currano**, Rebecca Maria, **PhD**, Stanford University, 2015, "Reflective practice in engineering design"
15. **Curran**, Allen, **PhD**, ME, Stanford University, November, 1986, "An Intelligent Control System Design Aid". Al is an Associate Professor of Mechanical Engineering and Engineering Mechanics at the Michigan Technological University.

16. **Dillier**, Norbert, **PhD**, Biomedical Engineering, June, 1978, "Enwicklung und Klinische Evaluation einer Gehorsprothese fue Sensorish Taube Patienten Basierend auf der Elektrischen Stimulation des Achten Nervs", completed his thesis at the Swiss Federal Institute of Technology, under the direction of Professor Max Anliker. Norbert is now an Ober Assistant in the Ear Nose and Throat Clinic of the Kantonsspital Zurich.
17. **Edelman**, Jonathan, **PhD**, ME, Stanford University, December 2011, "Understanding Radical Breaks: media and behavior in small teams engaged in redesign scenarios."
18. **Edwards**, Lawrence James, **PhD**, ME, Stanford University, June, 1995, "Deformation field mapping: A representation for interactive free-form surface modeling."
19. **Eodice**, Michael T., **PhD**, Stanford University, May, 2000, "A Theory of Requirements Definition in Engineering Design."
20. **Eris**, Ozgur, **PhD**, ME, Stanford University, June, 2002, "Perceiving, Comprehending, and Measuring Design Activity through the Questions Asked while Designing."
21. **Feland**, John, **PhD**, ME, Stanford University, March, 2005, "Product Capital Model: modeling the value of design to corporate performance."
22. **Han**, Byungwook Christopher, **PhD**, Stanford University, 2011, "Decision analytic approach to customer experience design"
23. **Helms**, Michael, **PhD**, ME, Stanford University, "Anomaly Detection as Creative Insight."
24. **Jameson**, John, **PhD**, ME, Stanford University, June, 1985, "Analytic Techniques for Automated Grasp". John now works at the NASA Johnson Space Center, Houston, Texas. He is in charge of advanced Prehensor development and manipulator development for the Flight Tele-retriever system.
25. **Johnson**, Michelle Jillian, **PhD**, ME, Stanford University, June, 2002, "Embedded corrective force cueing: A force-feedback control design to optimize the motivating potential of robot-assisted therapy devices to increase bilateral functioning in hemiplegic stroke patients."
26. **Ju**, Wendy, **PhD**, ME, Stanford University, June, 2008, "The Design of Implicit Interactions."
27. **Jung**, Malte, **PhD**, ME, Stanford University, August 2011, "Engineering Team Performance and Emotion: affective interaction dynamics as indicators of design team performance."
28. **Kim**, Noah, **PhD**, ME, Stanford University, December 2012, "Automatic Hole Cutting in Overset Grids using the X-Rays Approach"
29. **Koo**, Jeamin, **PhD**, ME, Stanford University, June 2014, " Design Requirements for car-to-driver interaction in the context of semi-autonomous driving"
30. **Kramer**, Jim, **PhD**, ME, Stanford University, June 1996, "The TalkingGlove(RTM): Hand-gesture-to-speech using an instrumented glove and a tree-structured neural classifying vector quantizer."
31. **Kress**, Gregory, **PhD**, ME Stanford University, December 2012, "The Effects of Team Member Differences on Emergent Team Dynamics and Long-Term Innovative Performance in Engineering Design Teams."
32. **Lee**, Burton, **PhD**, ME, Stanford University, June 2001, "Failure modes and effects analysis with Bayesian belief networks: Bridging the design-diagnosis modeling gap."
33. **Lees**, David, **PhD**, ME, Stanford University, June 1994, "A graphical programming language for service robots in semi-structured environments."
34. **Liang**, Anthony Tao, **PhD**, ME, Stanford University, June 2001, "Mapping experience: understanding socio-technical inter-team knowledge sharing in product development communities."

35. **Liang**, Lin, **PhD**, ME, Stanford University, September 1991, "Implementation of a Theory of Robotic Machine Learning of Natural Language". Lin is now a research associate with Professor Patrick Suppes at the Stanford Center for the Study of Information and Language (CSLI).
36. **Mabogunje**, Ade, **PhD**, ME, Stanford University, September, 1997, "Measuring conceptual design process performance in mechanical engineering: A question based approach."
37. **Manohar**, Karthik, **PhD**, Stanford University, 2011, "Procut architecture portfolio decision framework."
38. **Martelaro**, Nikolas, **PhD**, Stanford University, 2018, "The needfinding machine."
39. **Milne**, Andrew, **PhD**, ME, Stanford University, June, 2005, "An information-theoretic approach to the study of ubiquitous computing workspaces supporting geographically distributed engineering design teams as group-users."
40. **Minneman**, Scott, **PhD**, ME, Stanford University, September, 1991, "The Social Construction of a Technical Reality: empirical studies of group engineering design practice."
41. **Mok**, Brian, **PhD**, ME, Stanford University, December 2017, "Transition of Control in Partially Autonomous Vehicles: Driver Response and the Design of Vehicle Interfaces", Stanford University, Stanford, USA. December 2017. Advisors: Prof. Larry Leifer and Dr. Wendy Ju
42. **Neeley**, Lawrence, **PhD**, ME, Stanford University, June, 2007, "Adaptive design expertise: A theory of design thinking and innovation."
43. **Oswald**, Hanspeter, **PhD**, Biomedical Engineering, June, 1978, "Unterschiede in der Erkennung Bewegter Stereoskopischer Bilder mit Monokularen Merkmalen Verschiedenen Grades", completed his thesis at the Swiss Federal Institute of Technology, under the direction of Professor Max Anliker. Hanspeter now runs his own consultancy in the field of diagnostic medical imaging.
44. **Petersen**, Soren, **PhD**, ME, Stanford University, June, 2009, "Design quantification: Design concept argumentation as related to product performance metrics."
45. **Petrig**, Benno, **PhD**, Biomedical Engineering, June, 1980, "Nachweis von Stereopsis bei Kindern Mittels Stochastischer Punktstereogramme und der Zugehörigen Evozierten Potential", at the Swiss Federal Institute of Technology, under the direction of Professor Max Anliker. Benno is now an Associate Professor of Biomedical Engineering at the Eye Institute in Sans Switzerland.
46. **Reiner**, Kurt, **PhD**, ME, Stanford University, June, 2006, "A framework for knowledge capture and a study of development metrics in collaborative engineering design."
47. **Rosenberg**, Louis, **PhD**, ME, Stanford University, June, 1994, "Virtual fixtures": Perceptual overlays enhance operator performance in telepresence tasks
48. **Sadler**, Joel Anthony, **PhD**, ME, Stanford University, 2016, "The anatomy of creative computing [electronic resource] : enabling novices to prototype smart devices"
49. **Savig**, Erica Swesey, **PhD**, Stanford University, 2016, "Design research on the core needs of children and families during stem cell transplantation,
50. **Schar**, Mark, **PhD**, ME, Stanford University, August 2011, "Pivot Thinking and the Differential Sharing of Information within New Product Development Teams."
51. **Sirkin**, David, **PhD**, ME, Stanford University, December 2011, "Design at a Distance: tangible telepresence using gesture and robotics."
52. **Skogstad**, Philipp, **PhD**, ME, Stanford University, June, 2009, "A unified innovation process model for engineering designers and managers."

53. **Sonalkar**, Neerajsatish, **PhD**, ME, Stanford University, June 2012, "A Visual Representation to Characterize Moment-to-Moment Concept Generation Through Interpersonal Interactions in Engineering Design Teams."
54. **Stephenson**, Kathrine J., **PhD**, Stanford University, 2017, "Traditional skills, non-traditional demographics: rethinking novice digital design tool education for outside the engineering major"
55. **Tang**, John, **PhD**, ME, Stanford University, December, 1988, "Toward an Understanding of the Use of Shared Workspaces by Design Teams".
56. **Toye**, George, **PhD**, ME, Stanford University, December, 1990, "Management of nonhomogeneous functional modular redundancy for fault-tolerant programmable electromechanical systems."
57. **Tsai**, Mark, **PhD**, ME, Stanford University, June, 2001, "Web-based integrated medical information system for primary care physicians, students of medicine, and medical device design."
58. **Van der Loos**, Machiel, **PhD**, ME, Stanford University, December 1993, "A history list design methodology for interactive robotic systems".
59. **Wagner**, Joseph, **PhD**, ME, Stanford University, December 2010, "Social Responses to Somatic Technology: an application of human-service robotics."
60. **Wampler II**, Charles, **PhD**, ME, Stanford University, December 1984, "Computer Methods in Manipulator Kinematics, Dynamics, and Control: a Comparative Study". Charlie is now a staff scientist in the Mathematics Department, General Motors Research Labs, Warren Michigan.
61. **Wang**, Walter, **PhD**, ME, Stanford University, March, 1992, "A knowledge-based computational tool for creative conceptual design."
62. **Wickman**, Leslie A., PhD, Graduate Special Program, Stanford University, June, 1994, "The Influence of Reduced Gravity on Human Load-Carrying Capability and Preferred Load Placement".
63. **Yen**, Samuel, **PhD**, ME, Stanford University, December 2001, "Capturing multimodal design activities in support of information retrieval and process analysis."

### **Pre-Doctoral Students (10 as of 21.oct.2018)**

1. **Baltodano**, Sonia
2. **Ford**, Chris
3. **Ge**, Xiao
4. **Johns**, Mishel
5. **Jung**, Summer Da Hyang
6. **Kerst**, Capella Frances
7. **Makokha**, Joseph
8. **Moore**, Dylan
9. **Park**, So Yeon
10. **Sibi**, Srinath

### **Post-Doctoral Scholars & Research Staff (11 as of 21.oct.2018)**

1. **Aquino**, Lauren Shluzas
2. **Auernhammer**, Jan
3. **Cockayne**, William
4. **Currano**, Rebecca
5. **Ju**, Wendy
6. **Kim**, Soh Yeong
7. **Lee**, Burton
8. **Mabogunje**, Ade
9. **Sirkin**, David Michael
10. **Sonalkar**, Neeraj
11. **Toye**, George