CURRICULUM VITAE

Daniel E. Koditschek

Alfred Fitler Moore Professor and Chair
Electrical and Systems Engineering Department
School of Engineering and Applied Science, University of Pennsylvania
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Personal:

Born 7/26/54, Montclair, NJ; Married with two children.

Education:

5/83 Ph.D. in Electrical Engineering, Yale University
5/77 B.S. (cum laude) in Engineering and Applied Science, Yale University
5/72 Valedictorian, Montclair Public High School

Employment:

1/05 Professor and Chair, Electrical and Systems Engineering Department, University of Pennsylvania
9/96 Professor, Electrical Engineering and Computer Science Department, University of Michigan
1/93 Associate Professor, Electrical Engineering and Computer Science Department, University of Michigan
7/87 Associate Professor, Electrical Engineering Department, Yale University
7/83 Assistant Professor, Electrical Engineering Department, Yale University

Awards, Honors and Fellowships:

11/03 IEEE Fellow
2/01 University of Michigan College of Engineering Award for Excellence in Research
12/98 Co-advisor (with P. P. Khargonekar) on 1998 IEEE Conference on Control Applications Best Student Paper
2/97 EECS Department Award for Excellence in Research
9/96 Board Member, International Federation of Robotics Research
10/90 Japan Society for Promotion of Science Research Fellowship, Tokyo Japan
5/86 National Science Foundation Presidential Young Investigator Award
1/86 Lilly Endowment Fellow
5/83 Henry Prentiss Becton Prize, Yale University Graduate School
6/80 National Science Foundation Graduate Fellowship
9/79 Sheffield Engineering Fellowship, Yale University

Patents:

11/02 US Patent 6,481,513: Single Actuator per Leg Robotic Hexapod (with M. Buehler and U. Saranli)
10/99 US Patent 5,963,244: Optimal Reconstruction of Tone Reproduction Curve (with L. K. Mestha, Y. R. Wang, S. A. Dianat, P. P. Khargonekar, E. Jackson, and T. E. Thieret)
5/98 US Patent 5,749,020: Coordinatization of Tone Reproduction Curve in Terms of Basis Functions (with L.K. Mestha, Y.R. Wong, S. Dianath, and P.P. Khargonekar)

Professional Society Memberships:

American Association for the Advancement of Science, American Association for Engineering Education, Association of Computing Machinery, American Mathematical Society, Electrical and Computer Engineering Department Heads Association, Institute of Electrical and Electronics Engineers, Mathematical Association of America, Society of Integrative and Comparative Biology, Society for Industrial and Applied Mathematics, Sigma Xi

Education

Teaching

Selected Keynote Presentations (Last Five Years)

6/05 "Programming Work." Plenary Talk, Robotics, Science & Systems, Cambridge, MA

4/04 "Piecewise Hamiltonian Models for Bioinspired Legged Locomotion." Invited Address, Midwest Dynamical Systems Meeting, Ann Arbor, MI

11/03 "Toward a Synthesis of Form and Function: Notes from the Pre-Genomic Era of Robotics." Invited Address, UM-Santa Fe Institute Workshop on Complex Systems, Ann Arbor, MI

10/03 "Symbols for Programming Work." Invited Address, Festschrift on the 70^{th} Birthday of Ruzena Bajcsy. Philadelphia, PA

7/03 "Coordination of Locomotion in Machines and Animals." Invited Address, Walking Machines, Biological and Artificial Systems,Zentrum fr interdisziplinre Forschung,July 3-5, Bielefeld, Germany

6/03 "Applications of Topology in Robotics." Invited Address, Workshop on Topology and Robotics, Forschungsinstitut fr Mathematik, ETH Zürich, Switzerland

7/02 "Biologically Inspired Robots." (joint presentation with Robert J. Full). DARPA Internal Biovision Seminar Series. May 13, 2002. Washington DC.

4/02 "Demonstration of RHex." Formal Presentation to Dr. Anthony Tether, Director of DARPA. Southwest Research Institute, San Antonio, TX. April 22, 2002.

4/02 "Better Work: Saying What to Learn and Learning What to Say to Your Legs." Invited Kenote Address, The Learning Workshop. Snowbird, Utah, April 2-5 2002

3/02 "Form and Function at Work: Toward Rational Machine Design'." Invited Outside Consultant's talk: European Robotics Research Network Robotics Brainstorming Meeting, Brussels, Belgium.

11/01 "Toward a Synthesis of Form and Function: Notes from the Pre-genomic Era of Robotics." 13th Annual Symposium on the Frontiers of Science, US National Academy of Sciences Invited Speaker. November 8-10, 2001. Irvine, CA.

10/01 "Hypothesizing Control Architectures for Legged Locomotion in Machines and Animals." Invited Symposium Presentation, UM Kinesiology Motor Development Research Consotium Symposium on Complexity and Emerging Motor Behavior. Ann Arbor MI.

1/01 "Hypothesizing Control Architectures for Legged Locomotion in Machines and Animals." Invited Symposium Presentation, Society for Integrative and Comparative Biology Annual Meeting, Symposium on Stability and Maneuverability, Chicago, IL

3/00 "Regulation and Composition of Cyclic Behaviors." (keynote presentation), Workshop on Algorithmic Foundations of Robotics, March 2000, Dartmouth NH

Courses Taught at University of Pennsylvania

ESE 112	Introduction to ESE – Devices	F'05, F'06	$\sim$ 40 enrolled
ESE 113	Introduction to ESE – Systems	S'06, S'07	$\sim$ 40 enrolled

Courses Taught at University of Michigan

EECS 203	Discrete Mathematics for Computer Science	F'97, F'98, W'99, W'00, F'00	$\sim$ 160 enrolled
EECS 216	Circuit Analysis	F'94, F'95	$\sim$ 80 enrolled
EECS 376	Introduction to the Foundations of Computer Science	F'02, W'03, F'03, W'04	$\sim$ 80 enrolled
EECS 442	Computer Vision	F'93, F'96	$\sim$ 20 enrolled
EECS 467	Undergraduate Introduction to Robotics	W'98	$\sim$ 20 enrolled
EECS 562	Nonlinear Systems Analysis and Control	W'96, W'97	$\sim$ 30 enrolled
EECS 567	Graduate Introduction to Robotics	W'94 , W'95	$\sim$ 20 enrolled
EECS 598	Seminar on Machine & Biological Locomotion	W'93, F'99, W'00	$\sim$ 10 enrolled

Mentoring

Postdoctoral Fellows Supported

Haldun Komsuoglu, NSF FIBR Postdoctoral Scholar, 9/05 - present
Jonathan Clark, DCI Postdoctoral Scholar, 9/04 - present
Richard Altendorfer, Computational Neuromechanics Project Postdoctoral Scholar, 8/00 - 9/03
Erich Staudacher, Computational Neuromechanics Project Postdoctoral Scholar, 8/98 - 9/00
William Schwind, Computational Neuromechanics Project Postdoctoral Scholar, 5/98 - 9/99

Doctoral Students Supervised

1. Martin Bühler: "Robotic Tasks with Intermittent Dynamics;" Ph.D. May, 1990, Yale University

   Present Position: Director of Robotics, Boston Dynamics (on leave: Assoc. Prof. Dept. of Mechanical Engineering, McGill University)

2. Elon Rimon: "Exact Robot Navigation Using Artificial Potential Functions;" Ph.D. Dec., 1990, Yale University

   Present Position: Prof., Dept. of Mechanical Engineering, The Technion, Israel

3. Louis L. Whitcomb: "Practical Adaptive Controllers for Robot Manipulators;" Ph.D. May, 1992, Yale University

   Present Position: Prof., Dept. of Mechanical Engineering, Johns Hopkins University

4. Alfred A. Rizzi: "Dynamically Dexterous Robotics;" Ph.D. Dec. 1994, Yale University

   Present Position: Research Scientist, Robotics Institute, Carnegie Mellon University

5. Dongmin Kim: "Calibration Issues in Robotics ;" Ph.D. Dec. 1995, University of Michigan

   Present Position: (no information)

6. Robert R. Burridge: "Toward a Dynamical Pick and Place;" Ph.D. May 1996, University of Michigan

   Present Position: Sr. Research Scientist, College of Computing, Georgia Institute of Technology

7. Peter J. Swanson: "Shaking Strategies for Sensorless Parts Orientation;" Ph.D. May 1996, University of Michigan

   Present Position: Senior Product Development Engineer, FANUC Robotics America, Rochester Hills, MI

8. Charles Cohen: "Dynamical Analysis and Recognition of Human Gesture;" Ph.D. Dec. 1996, University of Michigan (co-advisor with Professor Lynn Conway)

   Present Position: Vice President, Cybernet Inc., Ann Arbor, MI

9. William J. Schwind: "Spring Loaded Inverted Pendulum Running: A Plant Model;" Ph.D. Dec. 1997, University of Michigan

   Present Position: Member Technical Staff, Raytheon, Inc., Phoenix, AZ

10. Jun Nakanishi: "A Dynamics Based Brachiating Robot;" Ph.D. Dec. 1999, University of Nagoya, Japan (co-advisor with Prof. Toshio Fukuda, ME, Univ. Nagoya)

    Present Position: Member Technical Staff, ATR, Inc., Japan

11. Noah Cowan: "Vision Based Control Via Navigation Functions;" Ph.D. May, 2001, University of Michigan

    Present Position: Assistant Professor, Mechanical Engineering, Johns Hopkins University

12. Eric D. Klavins: "Decentralized Phase Regulation of Cyclic Robotic Systems;" Ph.D. May, 2001, University of Michigan (co-advisor with Prof. W. R. Rounds, EECS, UM)

    Present Position: Assistant Professor, Electrical Engineering, University of Washington, Seattle

13. Uluc Saranli: "Dynamic locomotion with a Hexapod Robot;" Ph.D. Sept, 2002, University of Michigan

    Present Position: Assistant Professor, Dept. Computer Engineering, Bilkent University, Turkey

14. Richard Groff: "Learning Piecewise Linear Approximations;" Ph.D. May, 2003, University of Michigan (co-advisor with Prof. P. P. Khargonekar, EECS, UM)

    Present Position: Assistant Professor, Dept. Electrical and Computer Engineering, Clemson University

15. Haldun Komsuoglu: "Biologically Inspired Clock Driven Robots;" Ph.D. Anticipated, Sept, 2004, University of Michigan

    Present Position: Postdoctoral Fellow, Department of Electrical and Systems Engineering, University of Pennsylvania

16. Pei-Chun Lin: "Proprioceptive Sensors for a Legged Robot;" Ph.D. May, 2005, University of Michigan

    Present Position: Post-doctoral Fellow, Dept. Materials Science and Engineering, University of Pennsylvania (not yet graduated)

17. Joel Weingarten: "Gait Adaptation and Optimization for a Legged Robot;" Ph.D. Anticipated, May, 2007, University of Michigan

    Present Position: (not yet graduated)

18. Gabriel Lopes: "Visual Registration for Legged Robot Navigation;" Ph.D. Anticipated, Sept, 2007, University of Michigan

    Present Position: (not yet graduated)

19. Jaeyun Jun: "A Climbing Robot;" Ph.D. Anticipated, May, 2010, University of Pennsylvania

    Present Position: (not yet graduated)

20. Goran Lynch: "Coordination of Legged Robots;" Ph.D. Anticipated, May, 2010, University of Pennsylvania

    Present Position: (not yet graduated)

Doctoral Student Committee Memberships (Last Ten Years)

AI:

Patrick Simen (EECS Ph.D. S'03)
Gregg Sharp (EECS Ph.D. W'01)
Daniel Berwick (EECS Ph.D. W'01)
Stephen Lin (EECS Ph.D. W'00)
Ella Atkins (EECS Ph.D S'98)
David Pennock (EECS Ph.D. S'98)
Robert Wray (EECS Ph.D. F'97)
Seth Rogers (EECS Ph.D. W'96)
Harmon Nine (EECS Ph.D. S'95)

Control:

Emre Enginarlar (EECS Ph.D. W'03)
Eric Westervelt (EECS Ph.D. W'03)
Ji-Woong Lee (EECS Ph.D. F'02)
Dhrubajyoti Kalita (EECS Ph.D. W'01)
Evan Yifeng Tsai (MEAM Ph.D. S'00)
Guiquan Chen (MEAM Ph.D. W'00)
Fugee Tsung (EECS Ph.D. F'99)
Cecilia Galarza (EECS Ph.D.F'99)
C. Chen (EECS Ph.D. S'98)
Tyrone Vincent (EECS Ph.D. F'98)

External:

Devin Jindrich (Integrative Biology, UC Berkeley, F'01)
Jana Kosecka (Robotics, U. Penn, Ph. D. W'96)
Kevin Lynch (Robotics, Carnegie Mellon, Ph.D. W'96)
Sanjiv Singh (Robotics, Carnegie Mellon, Ph.D. 5/94)

Mathematics:

Patrick Haggerty (UM, Ph.D.W'01)

Architecture:

Abdelaziz Fahmy (UM, Ph.D. W'99)

Undergraduate Projects Supervised (Last Five Years)

Joseph Raisanen (co-supervised with J. Weingarten) W'02-S'04
Katherine Scott (co-supervised with J. Weingarten) W'01-S'03
G. Clark Haynes (co-supervised with N. Cowan) S'00-S'02
Jingying Li (co-supervised with U. Saranli) S'01-F'02
Steven Lam (co-supervised with H. Komsuoglu) S'01 present Laura McWilliams (co-supervised with U. Saranli) S'01
Emily A Weitkamp (co-supervised with P.-C. Lin) S'01
Robert Peters (co-supervised with J. Weingarten) S'01
Richard Jansen (co-supervised with N. Cowan) S'98-W'99
Eric Carlson (co-supervised with N. Cowan) F'99-S'00
Benjamin Bachelor (co-supervised with E. Staudacher) S'99
Aaron Friedkin (co-supervised with E. Staudacher) S'99-W'00
Daniel Gisczak (co-supervised with N. Cowan) S'98

Service

University of Pennsylvania

1/05 - present Penn Department Chair, Electrical & Systems Engineering

University of Michigan

9/03 - 9/04	U-M CE Undergraduate Advisor
9/02 - 9/03	U-M EECS Honors and Awards Committee
6/00 - 5/01	U-M EECS Futures Committee (addressing possible split into CS and EE)
6/98 - 5/01	Chief Undergraduate Program Advisor, U-M Computer Science and Engineering
8/97 - 7/99	U-M EECS Representative to the Computational Mathematics and Statistics (COMAST) committee
6/95 - 5/97	Chairman, U-M College of Engineering Control Seminar Series
1/95 - 5/98	EECS Undergraduate Program Advisor, Computer Science and Engineering
8/94 - 7/97	EECS Liaison to U-M Mathematical Sciences Throughout the Curriculum Committee
8/93 - 8/95	EECS Departmental Computing Organization Executive Committee

External Organizations

Major Technical Conferences (Last Ten Years)

10/99	General Co-chairman International Symposium on Robotics Research, Snowbird, UT.
4/99	Workshop and Tutorials Chair IEEE International Conference on Robotics and Automation, Detroit, MI.
6/98	General Co-Chairman 1998 IMA Meeting on Animal Gaits and Locomotion

Selected Government Committees

National Research Council

2/93	Chairman, Engineering B Panel, NRC Administration of NSF Graduate Fellowshi
5/92	Chairman, National Academy of Sciences Workshop on Expanding Access to Japanese Robotics R&D, National Research Council Office of Japan Affairs, Washington DC.
2/91	Review Panelist, NRC Administration of NSF Graduate Fellowship

National Science Foundation

11/01	ECS-Systems Program, Review Panelist
5/98	Engineering Research Center review Panelist
2/98	CISE-IRI Program, Review Panelist
2/97	CISE-IRI Program, Review Panelist
5/97	Engineering Research Center review Panelist
3/96	CISE-IRI Program, Review Panelist (declined due to pneumonia)
2/95	CISE-IRI Program, Review Panelist
4/94	CISE-IRI Program, Review Panelist
2/93	CISE-IRI Program, Review Panelist
4/92	CISE-IRI Program, Review Panelist

Industrial Contacts and Consulting

10/02 - 7/03	Mecheligent, Canada: assisting the creation and initial capitalization drive for commercializing our patented robot, RHex
10/96 - 12/00	Xerox Webster Research Labs: Process Controls for Dry Powder Marking
1/95 - 12/96	Brief Consultations with Various Robotics and Automation Companies: Robomatix, Auburn Hills, MI; Mannetron, Grand Rapids, MI; Warner Electronics, Ann Arbor, MI.
7/95 - 9/96	Toshiba Energy Research Laboratory: Hosted visiting scientist for one year to discuss intelligent fossil fuel plant generating controls
7/94 - 8/96	Brief Consultations with Various Display Technology Materials Handling Companies: Photonics Systems, Inc.; Progressive Systems Technology, Inc. ; Brooks Automation, Inc. (as part of duties within the U-M DTM Center).
6/94 - 8/94	Xerox Webster Research Labs: Exploring Collaboration with U-M
7/85 - 7/87	GMF Robotics Corporation: Robot Arm Control
7/83 - 7/86	Olin Metals Research Laboratories: Control of an Experimental Metal Casting Process.
2/82- 1/83	Macbeth, a Division of Kollmorgen Corporation: Control of a Positioning Servo.

Funding

Federal Grants and Contracts

1. *Robotics in Scansorial Environments, Phase II,* **DARPA/SPAWAR N66001-050C-8025.**

   Amount: $6,696,687; **Duration:** 4/11/05 - 1/31/07.

   Investigators: Koditschek, Project Director, with 6 co-PIs & 1 Corporate Subcontrator

2. *12/31/04 - 8/31/07,* **National Geospatial - DCI.**

   Amount: $173, 731 ; **Duration:** Exploiting Materials Properties for Enhanced Dynamical Behaviors in Legged Robots.

   Investigators: Koditschek, PI & Postdoctoral Fellow Advisor

3. *9/15/05 - 8/31/06,* **National Science Foundation 0530563.**

   Amount: $ 100, 000; **Duration:** Contextualized, Social, Self-paced Engineering Education for Life-long Learners.

   Investigators: Koditschek, PI

4. *9/1/04 - 8/31/07,* **National Science Foundation 0425878.**

   Amount: $ 751, 281; **Duration:** Frontiers of Integrative Biological Research: Neuromechanical Systems Biology .

   Investigators: Koditschek, subcontractor to UC Berkeley PI

5. *Robotics in Scansorial Environments,* **DARPA/SPAWAR N660001-03-C-8045.**

   Amount: $3,359,929; **Duration:** 8/1/03 - 1/31/05.

   Investigators: Koditschek, Project Director, with 6 co-PIs & 1 Corporate Subcontrator

6. *The CNM Hexapod,* **DARPA/SPAWAR N66001-00-C-8026.**

   Amount: $2,849,642; **Duration:** 6/00-5/03.

   Investigators: Koditschek, Project Director, with 3 co-PIs

7. *Computational Neuromechanics,* **DARPA/ONR N00014-98-1-0747.**
   Amount: $5,626,395; **Duration:** 7/98-6/03.
   Investigators: Koditschek, Project Director, with 4 co-PIs
8. *9th Intl. Symp. Robotics Research,* **NSF-IIS 98-15084 .**
   Amount: $30,000; **Duration:** 9/99-8/00.
   Investigators: Koditschek, PI (with co-PI J. Hollerbach, CS Dept., U. Utah)
9. *An Event-Driven Approach to Autonomous Assembly,* **NSF-INT 98-19890 .**
   Amount: $35,396; **Duration:** 4/99-3/02.
   Investigators: Koditschek, PI (with co-PI H. I. Bozma, CS Dept, Bogazici Univ., Turkey)
10. *Programming Human Reaching and Locomotion Tasks,* **DOE SBIR.**
    Amount: Retraction due to EAI corporate takeover of Transom invalidating terms of SBIR program; **Duration:** Submitted 5/98; Awarded 11/98; Retracted 12/98.
    Investigators: Transom, Inc, (with Koditschek technical co-PI)
11. *Modeling, Sensing And Algorithm Design For Color Xerographic Process ,* **NSF-ECS 96-32801 (GOALI) .**
    Amount: $221,385; **Duration:** 7/96-6/01.
    Investigators: Koditschek, PI (with co-PI P.P. Khargonekar, EECS, UM & L. K. Mestha, & T. E. Thieret, Principle Scientists, Xerox Corp.)
12. *Micro Instrumentation of Insects for the Study of Gait Regulation ,* **NSF-IRI 96-12357 (SGER).**
    Amount: $50,000; **Duration:** 8/96-7/98.
    Investigators: Koditschek, PI (with co-PI S. B. Crary, U-M Solid State Electronics Lab and co-PI T. E. Moore, U-M Dept. of Biology)
13. *Dynamically Dexterous Robots via Switched and Tuned Oscillators,* **NSF-IRI 95-10673 .**
    Amount: $217,000; **Duration:** 8/95-8/98.
    Investigators: Koditschek, PI
14. *Visual Sensors and Controllers for Advanced Robotics ,* **NSF CISE-CDA 94-22014.**
    Amount: $ 81,017; **Duration:** 4/95-4/96.
    Investigators: Koditschek, PI
15. *Dynamical Dexterity in Robotic Manipulation ,* **NSF CISE-IRI 91-23266 & 93-96167 & ARPA B457.**
    Amount: $325,457; **Duration:** 5/92-4/96.
    Investigators: Koditschek, PI
16. *Travel Support for Exceptional Young US Researchers to Attend IROS'91,* **NSF International Programs Division .**
    Amount: $ 18,250; **Duration:** 11/91-11/92.
    Investigators: Koditschek, PI
17. *Nonstandard Robotic Tasks,* **NSF DMC-8552851 (Presidential Young Investigator Award).**
    Amount: $312,500; **Duration:** 6/86-6/91.
    Investigators: Koditschek, PI

18. *Engineering Research Equipment Grant,* **NSF DMC-8606213.**
    Amount: $78,070; **Duration:** 6/86-6/87.
    Investigators: Koditschek, PI

Corporate Gifts and Grants

1. *Intelligent Fossil Fuel Plant Startup Procedures,* **EPRI RP8030-17.**
   Amount: $100,000; **Duration:** 4/94-8/96.
   Investigators: Koditschek (as co-PI with K. S. Narendra on NSF-IRI 92-16823)
2. *On the Feasibility of Insect Robots/Biobots,* **U-M OVPR 135756.**
   Amount: $ 11,000; **Duration:** 9/93-9/95.
   Investigators: Koditschek, PI (with co-PI S. B. Crary, U-M Solid State Electronics Lab and co-PI T. E. Moore, U-M Dept. of Biology)
3. *TRAM and other T800 processor boards,* **Inmos Corporation Donation.**
   Amount: $32,000 (approximate value); **Duration:** 8/91.
   Investigators: Koditschek
4. *Electric brakes for juggling robot,* **Warner Corporation Donation.**
   Amount: $5000 (approximate value); **Duration:** 12/90.
   Investigators: Koditschek
5. *TRAM and other T800 processor boards,* **Inmos Corporation Donation.**
   Amount: $30,000 (approximate value); **Duration:** 8/90.
   Investigators: Koditschek
6. *T800 and A110 microprocessor chips,* **Inmos and Pixar Corporations Donation.**
   Amount: $20,000 (approximate value); **Duration:** 8/89.
   Investigators: Koditschek
7. *Variable Reluctance Actuators,* **Superior Electric Corporation Donation.**
   Amount: $20,000 (approximate value); **Duration:** 6/89.
   Investigators: Koditschek
8. *Logic Analyzer,* **Hewlitt Packard Corporation Donation.**
   Amount: $25,000 (approximate value); **Duration:** 11/88.
   Investigators: Koditschek
9. *Engineering Workstations,* **Hewlitt Packard Corporation Donation.**
   Amount: $150,000 (approximate value); **Duration:** 7/88.
   Investigators: Koditschek (co-PI with K. S. Narendra)
10. *Research Collaboration Grant,* **North American Philips Corporation Philips Laboratories.**
    Amount: $20,000; **Duration:** 5/88-5/89.
    Investigators: Koditschek

11. *Item 100 Transputer Evaluation Module and T800 floating point processors,* **Inmos Corporation Donation.**
    Amount: $35,000 (approximate value); **Duration:** 1/88.
    Investigators: Koditschek
12. *P-60 Robot Arm,* **General Electric Corporation Donation.**
    Amount: $62,000 (approximate value) ; **Duration:** 5/87-5/88.
    Investigators: Koditschek (co-PI, with V. J. Lumelsky)
13. *A-500 Robot Arm,* **GMF Robotics Corporation Donation.**
    Amount: $47,000 (approximate value); **Duration:** 5/87.
    Investigators: Koditschek
14. *Research Collaboration Grant,* **North American Philips Corporation Philips Laboratories.**
    Amount: $40,000; **Duration:** 4/87-4/88.
    Investigators: Koditschek (co-PI with V. J. Lumelsky)
15. *Research Collaboration Grant and Equipment Donation,* **Inmos Corporation.**
    Amount: $20,000 (approximate value); **Duration:** 8/86-8/87.
    Investigators: Koditschek
16. *HP Graphics Workstation ,* **Hewlett Packard Corporation Donation.**
    Amount: $75,000; **Duration:** 5/86.
    Investigators: Koditschek (co-PI with K. S. Narendra)
17. *Natural Control of Robot Arms,* **NSF DMC-8505160 (Research Initiation Grant) .**
    Amount: $70,000; **Duration:** 6/85-6/87.
    Investigators: Koditschek
18. *Unrestricted Research Grant,* **GMF Robotics Corporation.**
    Amount: $10,000; **Duration:** 5/85-5/86.
    Investigators: Koditschek
19. *Additional micro-computer products granted the Center for Systems Science for work in robotics, control, and digital systems,* **Intel Corporation Full Donation.**
    Amount: $150,000 (approximate value); **Duration:** 12/84-12/85.
    Investigators: Koditschek (co-PI with K. S. Narendra)
20. *Micro-computer products granted the Center for Systems Science Robotics Lab,* **Intel Corporation Partial Donation.**
    Amount: $50,000 (approximate value); **Duration:** 7/84-7/85.
    Investigators: Koditschek
21. *Matching Equipment Donation to Yale Center for Systems Science,* **Texas Instruments Challenge Grant.**
    Amount: $16,000 (approximate value); **Duration:** 12/83-12/84.
    Investigators: Koditschek (co-PI with K. S. Narendra)

As Co-PI on Major Collaborative Grants

- DARPA FA8650-05-C-7260 Learning Locomotion 2005 - 2007, (jointly with PI D. D. Lee, et al, University of Pennsylvania), $ 1,541,000
- DARPA Brain Machine Interface Project 2002 - 2006 (jointly with D. Kipke, et al., University of Michigan)approximately $ 100,000 per annum;
- University of Michigan Rackham Interdisciplinary Consortium Pilot Study "Embodying Emotion" 2002-2003 (jointly with M. Gross, et al.) approximately $10,000 ;
- "Robotics and Materials Handling in Flat Panel Manufacturing," University of Michigan Center for Display Technology and Manufacturing, 1994, (jointly with M. Elta, et al.) approximately $50,000.
- NSF/EPRI Special Initiative on Intelligent Control, 1992-1995, (jointly with Prof. K. S. Narendra, Yale University) approximately $100,000; ;

Publications

Archival Journal Articles

1. D. E. Koditschek and K. S. Narendra. Fixed structure automata in a multi-teacher environment. *IEEE Transactions on Systems, Man, and Cybernetics*, SMC-7(8):616–624, Aug 1977.

2. D. E. Koditschek and K. S. Narendra. The stability of second order quadratic differential equations. *IEEE Transactions on Automatic Control*, AC-27(4):783–798, Aug 1982.

3. D. E. Koditschek and K. S. Narendra. Stabilizability of second order bilinear systems. *IEEE Transactions on Automatic Control*, AC-28(10):987–989, Oct 1983.

4. D. E. Koditschek and K. S. Narendra. Limit cycles of planar quadratic systems. *Journal of Differential Equations*, 54(2):181–195, Sept 1984.

5. D. E. Koditschek and K. S. Narendra. The controllability of planar bilinear systems. *IEEE Transactions on Automatic Control*, AC-30(1):87–89, 1985.

6. M. Bühler, D. E. Koditschek, and P.J. Kindlmann. A family of robot control strategies for intermittent dynamical environments. *IEEE Control Systems Magazine*, 10:16–22, Feb 1990.

7. Daniel E. Koditschek and Elon Rimon. Robot navigation functions on manifolds with boundary. *Advances in Applied Mathematics*, 11:412–442, 1990.

8. D. E. Koditschek and M. Bühler. Analysis of a simplified hopping robot. *International Journal of Robotics Research*, 10(6):587–605, Dec 1991 .

9. E. Rimon and D. E. Koditschek. The construction of analytic diffeomorphisms for exact robot navigation on star worlds. *Transactions of the American Mathematical Society*, 327(1):71–115, Sep 1991.

10. Daniel E. Koditschek. The control of natural motion in mechanical systems. *ASME Journal of Dynamic Systems, Measurement, and Control*, 113(4):547–551, Dec 1991.

11. Daniel E. Koditschek. Applications of natural motion control. *ASME Journal of Dynamic Systems, Measurement, and Control*, 113(4):552–557, Dec 1991.

12. Alfred A. Rizzi, Louis L. Whitcomb, and D. E. Koditschek. Distributed real-time control of a spatial robot juggler. *IEEE Computer*, 25(5):12–26, May 1992.

13. Elon Rimon and D. E. Koditschek. Exact robot navigation using artificial potential fields. *IEEE Transactions on Robotics and Automation*, 8(5):501–518, Oct 1992.

14. D. E. Koditschek. An approach to autonomous robot assembly. *Robotica*, 12:137–155, 1994.

15. D. E. Koditschek. Task encoding: Toward a scientific paradigm for robot planning and control. *Journal of Robotics and Autonomous Systems*, 9:5–39, 1992.

16. Louis L. Whitcomb, Alfred A. Rizzi, and Daniel E. Koditschek. Comparative experiments with a new adaptive contoller for robot arms. *IEEE Transactions on Robotics and Automation*, 9(1):59–70, Feb 1993.

17. M. Bühler, D. E. Koditschek, and P. J. Kindlmann. Planning and control of a juggling robot. *International Journal of Robotics Research*, 13(2):101–118, 1994.

18. P. J. Swanson, R. R. Burridge, and D. Koditschek. Global asymptotic stability of a passive juggling strategy: A parts possible feeding strategy. *Mathematical Problems in Engineering*, 1(3):193–224, 1995.

19. A. A. Rizzi and D. E. Koditschek. An active visual estimator for dexterous manipulation. *IEEE Transactions on Robotics and Automation*, 12(5):697–713, 1996.

20. J. Nakanishi, T. Fukuda, and D. E. Koditschek. Analytical approach to studies of two-link brachiating robot control. *Journal of the Robotics Society of Japan*, 16(4):79–86, 1998. (in Japanese).

21. T.E. Moore, S. B. Crary, D. E. Koditschek, and T. Conklin. Directed locomotion in cockroaches: Biobots. *Acta Entomologica Slovenica*, 6(2):71–78, 1998.

22. J. Nakanishi, T. Fukuda, and D. E. Koditschek. Study on the control of two-link brachiating robot -experimental implementation of a target dynamics controller. *Journal of the Robotics Society of Japan*, 17(1):110–117, 1999. (in Japanese).

23. R. R. Burridge, A. A. Rizzi, and D. E. Koditschek. Sequential composition of dynamically dexterous robot behaviors. *Int. J. Rob. Res.*, 18(6):534–555, Jun 1999.

24. William J. Schwind, Jun Ji, and Daniel E. Koditschek. A physically motivated further note on the mean value theorem for integrals. *American Mathematical Monthly*, 106(6):559–564, 1999.

25. J. Nakanishi, T. Fukuda, and D. E. Koditschek. Brachiation on a ladder with irregular intervals. *Transactions of the Japan Society of Mechanical Engineering*, 65(639):149–156, 1999.

26. R.J. Full and D. E. Koditschek. Neuromechanical hypotheses of legged locomotion on land. *J. of Experimental Biology*, 202:3325–3332, 1999.

27. Jun Nakanishi, Toshio Fukuda, and Daniel E. Koditschek. A brachiating robot controller. *IEEE Trans. Rob. Aut.*, 16(2):109–123, 2000.

28. William J. Schwind and Daniel E. Koditschek. Approximating the stance map of a 2 dof monoped runner. *Journal of Nonlinear Science*, 10(5):533–588, 2000.

29. D. E. Koditschek and H. I. Bozma. Assembly as a noncooperative game of its pieces: analysis of 1d sphrere assemblies. *Robotica*, 19(1):93–108, 2001.

30. J. Nakanishi, T. Fukuda, and D. E. Koditschek. Swing amplitude control of a two-link brachiating robot using a hybrid controller (in japanese). *Journal of the Robotics Society of Japan*, 19(5):652–659, 2001.

31. Uluc Saranli, Martin Buehler, and Daniel E. Koditschek. Design, modeling and control of a compliant hexapod robot. *Int. J. Rob. Res.*, 20(7):616–631, 2001.

32. R. Altendorfer, N. Moore, H. Komsuoglu, M. Buehler, Jr. H.B. Brown, D. McMordie, U. Saranli, R. Full, and D. E. Koditschek. RHex: A biologically inspired hexapod runner. *Autonomous Robots*, 11:207–213, 2001.

33. Robert W. Ghrist and Daniel E. Koditschek. Safe cooperative robot dynamics on graphs. *SIAM J. on Contr. Opt.*, 40(5):1556–1575, 2002.

34. C. S. Karagöz, H. I. Bozma, and D. E. Koditschek. Edar - a mobile robot for parts' moving based on a game-theoretic approach. *IEE Electronics Letters*, 38(3):147–149, 2002.

35. Noah J. Cowan, Joel D. Weingarten, and Daniel E. Koditschek. Visual servoing via navigation functions. *IEEE Trans. Rob. Aut.*, 18:521–533, 2002.

36. Eric Klavins and Daniel E. Koditschek. Phase regulation of decentralized cyclic robotic systems. *Int. J. Rob. Res.*, 21(3):257–275, 2001.

37. R.J. Full, T. Kubow, J. Schmitt, P. Holmes, and D. Koditschek. Quantifying dynamic stability and maneuverability in legged locomotion. *Integrative and Comparative Biology*, 42(1):149–157, 2002.

38. E. Westervelt, J. Grizzle, and D. Koditschek. Hybrid zero dynamics of planar biped walkers. *IEEE Transactions on Automatic Control*, 48:42–56, December 2003.

39. Richard E. Groff, Pramod P. Khargonekar, and Daniel E. Koditschek. A local convergence proof for the minvar algorithm for computing continuous piecewise linear approximations. *SIAM Journal on Numerical Analysis*, 41(3):983–1007, 2003.

40. Raffaele Ghigliazza, Richard Altendorfer, Philip Holmes, and D. E. Koditschek. Passively stable conservative locomotion. *SIAM Journal on Applied Dynamical Systems*, 2(2):187–218, 2003.

41. Richard Altendorfer, D. E. Koditschek, and Philip Holmes. Stability analysis of legged locomotion models by symmetry-factored return maps(invited paper). *Int. J. Rob. Res*, 23(10/11):979–1000, 2004.

42. Richard Altendorfer, D. E. Koditschek, and Philip Holmes. Stability analysis of clock-driven rigid-body slip model for rhex. *Int. J. Rob. Res*, 23(10/11):1001–1012, 2004.

43. C. S. Karagoz, H. I. Bozma, and D. E. Koditschek. Feedback-based event-driven parts moving. *IEEE Transactions on Robotics*, 20(6):1012–1018, 2004.

44. Uluc Saranli, A. A. Rizzi, and D.E. Koditschek. Model-based dynamic self-righting maneuvers for a hexapedal robot. *Int. J. Rob. Res.*, 23(9):903–918, 2004.

45. Daniel E. Koditschek, Robert J. Full, and Martin Buehler. Mechanical aspects of legged locomotion control (invited paper). *Arthropod Structure and Development*, 33(3):251–272, 2004.

46. Pei-Chun Lin, Haldun Komsuoglu, and Daniel E. Koditschek. A leg configuration measurement system for full body pose estimates in a hexapod robot. *IEEE Transactions on Robotics*, 21(3):411–422, 2005.

47. R. M. Ghigliazza, R. Altendofer, P. Holmes, and D. Koditschek. A simply stabilized running model. *SIAM Review*, 47(3):519–549, 2005.

48. Gabriel A. D. Lopes and Daniel E. Koditschek. Level sets and stable manifold approximations for perceptually driven non-holonomically constrained navigation. *Advanced Robotics*, 19(10):1081–1095, 2005.

49. Philiip Holmes, Robert J. Full, Daniel E. Koditschek, and John Guckenheimer. Dynamics of legged locomotion: Models, analyses, and challenges. *SIAM R EVIEW*, 48(2):207–304, 2006.

50. Pei-Chun Lin, H. Komsuoglu, and D.E. Koditschek. Sensor data fusion for body state estimation in a hexapod robot with dynamical gaits. *IEEE Transactions on Robotics*, 22(5):932–943, 2006.

51. Gabriel A. D. Lopes and Daniel E. Koditschek. Visual servoing for nonholonomically constrained three degree of freedom kinematic systems. *IEEE Transactions on Robotics*, (to appear), 2006.

52. Joseph C. Spagna, Daniel I. Goldman, Pei-Chun Lin, Daniel E. Koditschek, and Robert J. Full. Distributed feet enhance mobility in many-legged animals and robots. *Bioinspiration and Biomimetics*, (in press), 2006.

Books

John M. Hollerbach and Daniel E. Koditschek (eds.). *Robotics Research: The Ninth International Symposium*. Springer-Verlag, London, 2000.

Refereed Conference Publications

1. Daniel E. Koditschek. Natural motion for robot arms. In *IEEE Proceedings 23rd Conference on Decision and Control*, pages 733–735, Las Vegas, Dec 1984.

2. Daniel E. Koditschek. Adaptive strategies for the control of natural motion. In *IEEE Proceedings 24th Conferenceon Decision and Control*, pages 1405–1409, Fort Lauderdale, Dec 1985.

3. Daniel E. Koditschek. Robot kinematics and coordinate transformations. In *IEEE Proceedings 24th Conference on Decision and Control*, pages 1–4, Fort Lauderdale, Dec 1985.

4. Daniel E. Koditschek. Exact robot navigation by means of potential functions: Some topological considerations. In *IEEE International Conference on Robotics and Automation*, pages 1–6, Raleigh, NC, Mar 1987.

5. Daniel E. Koditschek. High gain feedback and telerobotic tracking. In *Workshop on Space Telerobotics*, pages 355–363, Pasadena, CA, Jan 1987. Jet Propulsion Laboratory, California Institute of Technology.

6. E. Rimon and D. E. Koditschek. Exact robot navigation using cost functions: The case of spherical boundaries in *en*. In *IEEE International Conference on Robotics and Automation*, pages 1791–1796, Philadelphia, PA, Apr 1988.

7. M. Bühler and D. E. Koditschek. Analysis of a simplified hopping robot. In *IEEE International Conference on Robotics and Automation*, pages 817–819, Philadelphia, PA, Apr 1988.

8. Daniel E. Koditschek. Strict global lyapunov functions for mechanical systems. In *Proc. American Control Conference*, pages 1770–1775, Atlanta, GA., Jun 1988. American Automatic Control Council.

9. M. Bühler , D. E. Koditschek, and P. J. Kindlmann. A one degree of freedom juggler in a two degree of freedom environment. In *Proc. IEEE Conference on Intelligent Robots and Systems*, pages 91–97, Tokyo, Japan, Oct 1988.

10. D. E. Koditschek. Application of a new Lyapunov function to global adaptive attitude tracking. In *Proc. 27th IEEE Conference on Decision and Control*, pages 63–68, Austin, TX, Dec 1988.

11. M. Bühler, D. E. Koditschek, and P.J. Kindlmann. A family of robot control strategies for intermittent dynamical environments. In *Proc. IEEE International Conference on Robotics and Automation*, pages 1996–2002, Arizona, May 1989.

12. M. Bühler, L. Whitcomb, F. Levin, and D. E. Koditschek. A new distributed real-time controller for robotics applications. In *Proc. 34th IEEE Computer Society International Conference — COMPCON*, pages 63–68, San Francisco, CA, Feb 1989. IEEE Computer Society Press.

13. M. Bühler, L. Whitcomb, F. Levin, and D. E. Koditschek. A distributed message passing computational and i/o engine for real-time motion control. In *Proc. American Control Conference*, Pittsburgh, PA, Jun 1989. American Control Society.

14. E. Rimon and D. E. Koditschek. The construction of analytic diffeomorphisms for exact robot navigation on sphere worlds. In *Proc. IEEE International Conference on Robotics and Automation*, pages 21–27, Arizona, May 1989.

15. D. E. Koditschek. Autonomous mobile robots controlled by navigation functions. In *Proc. Second IEEE International Workshop on Intelligent Robots and Systems*, pages 639–645, Tsukuba, Japan, Sept 1989. IEEE.

16. D. E. Koditschek. Application of a new Lyapunov function to global robot navigation. In *Proc. 28th IEEE Conference on Decision and Control*, page (not in Proceedings: available from author), Tampa, FL, Dec 1989.

17. E. Rimon and D. E. Koditschek. Exact robot navigation in topologically simple but geometrically complicated environments. In *Proc. IEEE International Conference on Robotics and Automation*, pages 1937–1943, Cincinnati, OH, May 1990.

18. L. L. Whitcomb and D. E. Koditschek. Robot control in a message passing environment. In *Proc. IEEE International Conference on Robotics and Automation*, pages 1198–1203, Cincinnati, OH, May 1990.

19. M. Bühler and D. E. Koditschek. From stable to chaotic juggling. In *Proc. IEEE International Conference on Robotics and Automation*, pages 1976–1981, Cincinnati, OH, May 1990.

20. D. E. Koditschek. Globally stable closed loops imply autonomous behavior. In *Proc. Fifth IEEE International Symposium on Intelligent Control*, pages 651–656, Philadelphia, PA, Sept 1990.

21. Daniel E. Koditschek. Assembly: Another source of nonholonomy in robotics. In *Proc. American Control Conference*, pages 1627–1632, Boston, MA, June 1991. American Society of Control Engineers.

22. Alfred Rizzi and Daniel E. Koditschek. Preliminary experiments in robot juggling. In *Proc. Int. Symp. on Experimental Robotics*, Toulouse, France, June 1991. MIT Press.

23. Louis L. Whitcomb and Daniel E. Koditschek. Automatic assembly planning and control via potential functions. In *Proc. IEEE International Workshop on Intelligent Robots and Systems*, pages 55–60, Osaka, Japan, Nov. 1991. IEEE.

24. Louis L. Whitcomb, D. E. Koditschek, and Joao B. D. Cabrera. Toward the automatic control of robot assembly tasks via potential functions: The case of 2-d sphere assemblies. In *IEEE Int. Conf. Rob. Aut.*, pages 775–780, Nice, France, May 1992.

25. Alfred A. Rizzi and D. E. Koditschek. Progress in spatial robot juggling. In *IEEE Int. Conf. Robt. Aut.*, pages 775–780, Nice, France, May 1992.

26. A. A. Rizzi and D. E. Koditschek. Further progress in robot juggling: The spatial two-juggle. In *IEEE Int. Conf. Robt. Aut.*, Atlanta, GA, May 1993.

27. D. E. Koditschek. A comparison of regulation and entrainment in two robot juggling strategies. In *International Symposium on Robotics Research*, 1994.

28. A. A. Rizzi and D. E. Koditschek. Further progress in robot juggling: Solvable mirror laws. In *Int. Conf. Rob. and Aut.*, pages 2935–2940, 1994.

29. William J. Schwind and D. E. Koditschek. Control of forward velocity for a simplified planar hopping robot. In *Proc. IEEE Int. Conf. Rob. Aut.*, 1995.

30. Peter J. Swanson and D. E. Koditschek. Global asymptotic stability of a passove juggler: A parts feeding strategy. In *Proc. IEEE Int. Conf. Rob. Aut.*, 1995.

31. Robert R. Burridge, Alfred A. Rizzi, and Daniel E. Koditschek. Toward a dynamical pick and place. In *RSJ/IEEE Int. Conf. on Int. Rob. and Syst.*, 1995.

32. Robert R. Burridge, Alfred A. Rizzi, and Daniel E. Koditschek. Obstacle avoidance in intermittent dynamical environments. In *The Fourth International Symposium on Experimental Robotics*, 1995 (to appear).

33. D. Kim, A. A. Rizzi, G. D. Hager, and Daniel E. Koditschek. A robust convergent visual servoing system. In *RSJ/IEEE Int. Conf. on Int. Rob. and Syst.*, 1995 (to appear).

34. H. I. Bozma, C. S. Karagoz, and D. E. Koditschek. Assembly as a noncooperative game of its pieces: The case of endogenous disk assemblies. In *IEEE International Symposium on Assembly and Task Planning*, 1995.

35. D. E. Koditschek. Controller composition for dynamically dexterous tasks. In *International Symposium on Robotics Research*, page (invited), 1995.

36. Wataro Shinohara and D.E. Koditschek. Intelligent control of a boiler-turbine plant based on switching control. In *34th IEEE Int. Conf. on Decision and Control*, pages 1762–1763, New Orleans, LA, Dec. 1995.

37. Robert R. Burridge, Alfred A. Rizzi, and Daniel E. Koditschek. Obstacle avoidance in intermittent dynamical environments ii: Discrete sampling. In *IEEE Int. Conf. on Int. Rob. and Syst.*, 1996.

38. L.K. Mestha, Y.R. Wang, E. Jackson S. Dianat, T. Thieret, P.P Khargonekar, and D.E. Koditschek. Toward a control oriented model of xerographic marking engines. In *35th IEEE Int. Conf. on Decision and Control*, pages 4837–4843, Kobe, Japan, Dec. 1997.

39. Charles J. Cohen, Lynn Conway, , and Daniel E. Koditschek. Dynamical system representation, generation and recognition of basic oscillatory motion gestures. In *Proc.1996 2nd Int. Int. Conf. Automatic Face and Gesture Recognition*, pages 60–65, 1996.

40. Jun Nakanishi, Toshio Fukuda, and Daniel E. Koditschek. Preliminary studies of a second generation brachiation robot controller. In *IEEE Int. Conf. on Int. Rob. and Syst.*, 1997.

41. William J. Schwind and Daniel E. Koditschek. Characterization of monoped equilibrium gaits. In *IEEE Int. Conf. on Int. Rob. and Syst.*, 1997.

42. J. Nakanishi, T. Fukuda, and D. E. Koditschek. Studies on the control of two-link brachiating robot (task encoding via target dynamics). In *JSME Annual Conf. on Robotics and Mechatronics (Robomec'97)*, pages 289–290, 1997.

43. J. Nakanishi, T. Fukuda, and D. E. Koditschek. Studies on the control of two-link brachiating robot (application of target dynamics method to the swing up problem). In *Annual Conf. of Society of Instrument and Control Engineers*, pages 791–792, 1997.

44. J. Nakanishi, T. Fukuda, and D. E. Koditschek. Forward velocity control of two-link brachiating robot. In *Annual Conf. of the Robotics Society of Japan*, pages 465–466, 1997.

45. Charles J. Cohen, Lynn Conway, , Daniel E. Koditschek, and Gerald P. Roston. Dynamic system representation of basic and non-linear in parameters oscillatory motion gestures. In *Proc. IEEE Int. Conf. Syst., Man and Cyb.*, pages 4513–4518, Orlando, FL, 1997.

46. Ulucs Saranli, William J. Schwind, and Daniel E. Koditschek. Toward the control of multi-jointed, monoped runner. In *IEEE Int. Conf. on Rob. and Aut.*, pages 2676–2682, Leuven, Belgium, May 1998.

47. Noah J. Cowan and Daniel E. Koditschek. Toward global visual servos and estimators for rigid bodies. In *International Conference on Robotics and Automation*, Leuven, Belgium, 1998.

48. J. Nakanishi, T. Fukuda, and D. E. Koditschek. Experimental implementation of a "target dymamics" controller on a two-link brachiating robot. In *IEEE Int. Conf. on Rob. and Aut.*, 1998.

49. Richard E. Groff, Daniel E. Koditschek, and Pramod P. Khargonekar. Invertible piecewise linear approximations for color reproduction. In *Proceedings of the 1998 IEEE International Conference on Control Applications*, volume 2, pages 716–720, 1998.

50. Noah J. Cowan and Daniel E. Koditschek. Planar image based visual servoing as a navigation problem. In *International Conference on Robotics and Automation*, volume 1, pages 611–617, Detroit, MI USA, 1999.

51. Richard E. Groff, Pramod P. Khargonekar, Daniel E. Koditschek, Tracy T. Thieret, and L.K. Mestha. Modeling and control of color xerographic processes. In *Proceedings of 38th IEEE Conference on Decision and Control*, volume 2, pages 1697–1702, 1999.

52. Uluc Saranli, Martin Buehler, and Daniel E. Koditschek. Design, modeling and control of a compliant hexapod robot. In *IEEE Int. Conf. Rob. Aut.*, pages 2589–2596, San Francisco, CA, April 2000.

53. E. Klavins and D.E. Koditschek. A formalism for the composition of concurrent robot behaviors. In *Proceedings of the IEEE Conference on Robotics and Automation*, pages 3395–3402, San Francisco, CA, 2000.

54. Serkan Karagoz, H. Isil Bozma, and Daniel E. Koditschek. Event driven parts moving in 2d endogenous environments. In *Proceedings of the IEEE Conference on Robotics and Automation*, pages 1076–1081, San Francisco, CA, 2000.

55. Richard E. Groff, Daniel E. Koditschek, and Pramod P. Khargonekar. Piecewise linear homeomorphisms: the scalar case. In *Proceedings of the IEEE-INNS-ENNS 2000 International Joint Conference on Neural Networks*, volume 3, pages 259–264, Como, Italy, 2000.

56. M. Buehler, U. Saranli, D. Papadopoulos, and D. E. Koditschek. Dynamic locomotion with four and six-legged robots. In *Proceedings of the Int. Symp. Adaptive Motion of Animals and Machines*, Montreal, Canada, 2000.

57. Noah J. Cowan, Gabriel A. D. Lopes, and Daniel E. Koditschek. Rigid body visual servoing using navigation functions. In *Conference on Decision and Control*, volume 4, pages 3920–3926, Sydney, Australia, December 2000. IEEE.

58. Haldun Komsuoglu and Daniel E. Koditschek. Preliminary analysis of a biologically inspired 1-dof clock stabilized hopper. In *Proceedings of the 4th World Multiconference on Systemics, Cybernetics and Informatics*, Orlando, FL, 2000.

59. E. Klavins and D.E. Koditschek. Stability of coupled hybrid oscillators. In *Proceedings of the IEEE International Conference on Robotics and Automation*, Seoul, Korea, 2001.

60. Haldun Komsuoglu, Dave McMordie, Uluc Saranli, Ned Moore, Martin Buehler, and Daniel Koditschek. Proprioception based behavioral advances in a hexapod robot. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 3650–3655, Seoul, Korea, 2001.

61. Richard Altendorfer, Uluc Saranli, Haldun Komsuoglu, Daniel Koditschek, H. Benjamin Brown Jr., Martin Buehler, Ned Moore, Dave McMordie, and Robert Full. Evidence for spring loaded inverted pendulum running in a hexapod robot. In *Proceedings of the International Symposium on Experimental Robotics*, Honolulu, HI, 2001. ().

62. E. Westervelt, J. Grizzle, and D. Koditschek. Zero dynamics of planar biped walkers with one degree of under actuation. In *IFAC 2002, Barcelona, Spain*, July 2002. Pre-print.

63. Uluc Saranli and Daniel E. Koditschek. Back flips with a hexapedal robot. In *Proceedings of the IEEE International Conference on Robotics and Automation*, volume 3, pages 2209–15, Washington DC., May 2002.

64. R. Altendorfer, R. M. Ghigliazza, P. Holmes, and D. E. Koditschek. Self-stability mechanisms for sensor-cheap legged locomotion. In *Fourth World Congress of Biomechanics*, Calgary, CA, 2002.

65. R. Altendorfer, R. M. Ghigliazza, P. Holmes, and D. E. Koditschek. Exploiting passive stability for hierarchical control. In *Fifth International Conference on Climbing and Walking Robots (CLAWAR)*, Paris, France, 2002.

66. Richard Altendorfer, Daniel E. Koditschek, and Philip Holmes. Towards a factored analysis of legged locomotion models. In *Proceedings of the IEEE International Conference on Robotics and Automation*, Taipei, Taiwan, 2003. 37 - 44.

67. Pei-Chun Lin, Haldun Komsuoglu, and Daniel E. Koditschek. A leg configuration sensory system for dynamical body state estimates in a hexapod robot. In *Proceedings of the IEEE International Conference on Robotics and Automation*, Taipei, Taiwan, 2003. 1391 - 1396.

68. Gabriel Lopes and Daniel Koditschek. Visual registration and navigation using planar features. In *IEEE ICRA, International Conference in Robotics and Automation*, volume 3, pages 3935–3940, Taipei, Taiwan, September 2003.

69. Uluc Saranli and Daniel E. Koditschek. Template based control of hexapedal running. In *Proceedings of the IEEE International Conference on Robotics and Automation*, pages 1374–1379, Taipei, Taiwan, 2003.

70. R. J. Full, T. Kubow, M. Garcia, W. Schwind, and D. Koditschek. Can a simple neural oscillator generate rapid running in cockroaches. In *Integrative and Comparative Biology Abstracts*, page 175, 2003.

71. J. D. Weingarten, G. A. D Lopes, R. E. Groff, M. Buehler, and D. E. Koditschek. Automated gait adaptation for legged robots. In *Proc. IEEE Int. Conf. Robotics and Automation*, volume 3, pages 2153–2158, 2004.

72. Pei-Chun Lin, Haldun Komsuoglu, and D. E. Koditschek. Legged odometry from body pose in a hexapod robot. In *Experimental Robotics*, page (submitted). Springer-Verlag, 2004.

73. Daniel E. Koditschek, Robert J. Full, and Martin Buehler. A principled approach to bio-inspired design of legged locomotion systems. In *Proceedings of the SPIE Defense and Security Symposium, UNMANNED GROUND VEHICLE TECHNOLOGY VI (OR54)*, page (to appear), Orlando, FL, 2004.

74. Pei-Chun Lin, Haldun Komsuoglu, and Daniel E. Koditschek. Toward a 6 dof body state estimator for a hexapod robot with dynamical gaits. In *Proceedings of the International International Conference on Intelligent Robots and Systems*, pages 2265–2270, Sendai, Japan, 2004.

75. U. Saranli, A. A. Rizzi, and D. E. Koditschek. Multi-point contact models for dynamic self-righting of a hexapod robot. In *Proceedings of the Sixth International Workshop on the Algorithmic Foundations of Robotics (WAFR '04)*, pages 75–90, Utrecht/Zeist, The Netherlands, July 2004.

76. K. Autumn, M. Buehler, M. Cutkosky, R. Fearing, D. Goldman, R. Groff, W. Provancher, A. A. Rizzi, U. Saranli, and A. Saunders. Robotics in scansorial environments. *Proceedings of SPIE*, 5804:291, 2005.

77. J. E. Clark and D. E. Koditschek. A spring-assisted one degree of freedom climbing model. In *Lecture Notes on Control and information Sciences*, volume 3, pages 43–64. Springer, 2006.

78. J. E. Clark, D. I. Goldman, T. S. Chen, R. J.Full, and D. E. Koditschek. Towards vertical dynamic climbing. In *Proceedings of the 9th International Conference on Climbing and Walking Robots*, Brussels, Belgium, 2006.

79. A. A. Rizzi, G. C. Haynes, R. J. Full, and D. E. Koditschek. Gait generation and control in a climbing hexapod robot. In R. Gerhart Grant, M. Shoemaker Charles, and W. Gage Douglas, editors, *Proceedings of SPIE – Volume 6230. Unmanned Systems Technology VIII*, volume 6230, page 623018. SPIE, 2006. Unmanned Systems Technology VIII 1.

Book Chapters

1. Daniel E. Koditschek. Automatic planning and control of robot natural motion via feedback. In Kumpati S. Narendra, editor, *Adaptive and Learning Systems: Theory and Applications*, pages 389–402. Plenum, 1986.

2. Daniel E. Koditschek. Robot control systems. In Stuart Shapiro, editor, *Encyclopedia of Artificial Intelligence*, pages 902–923. John Wiley and Sons, Inc., 1987.

3. Daniel E. Koditschek. Robot control systems. In R. Dorf, editor, *Encyclopedia of Robotics Applications and Automation*, pages 1349–1372. John Wiley and Sons, Inc., 1988.

4. Daniel E. Koditschek. Robot planning and control via potential functions. In O. Khatib, J. Craig, and T. Lozano-Pérez, editors, *The Robotics Review*, pages 349–368. MIT Press, 1989.

5. Daniel E. Koditschek. The Application of Total Energy as a Lyapunov Function for Mechanical Control Systems. In J. Marsden, Krishnaprasad, and J. Simo, editors, *Control Theory and Multibody Systems*, volume 97, pages 131–158. AMS Series in Contemporary Mathematics, 1989.

6. M. Bühler , D. E. Koditschek, and P.J. Kindlmann. A Simple Juggling Robot: Theory and Experimentation. In V. Hayward and O. Khatib, editors, *Experimental Robotics I*, pages 35–73. Springer-Verlag, 1990.
7. M. Bühler , D. E. Koditschek, and P.J. Kindlmann. Planning and Control of Robotic Juggling Tasks. In H. Miura and S. Arimoto, editors, *Fifth International Symposium on Robotics Research*, pages 321–332. MIT Press, 1990.
8. D.E. Koditschek. Dynamically dexterous robotics. In M. W. Spong, F. R. Lewis, and C. T. Abdalla, editors, *Press Reprint Volume in Robot Control*, pages 487–490. IEEE, 1993.
9. Alfred A. Rizzi, Louis L. Whitcomb, and D. E. Koditschek. Distributed real-time control of a spatial robot juggler. In J. Herath, editor, *Readings in Computer Architectures for Intelligent Systems*, page (to appear). IEEE Computer Society, 1992.
10. A. A. Rizzi and D. E. Koditschek. A dynamical sensor for robot juggling. In Koichi Hashimoto, editor, *Visual Servoing — Automatic Control of Mechanical Systems with Visual Sensors*, pages 229–256. World Scientific, 1993.
11. D. E. Koditschek. Advanced manipulation session summary. In Yoshiaki Shirai and Shigeo Hirose, editors, *Robotics Research: the Eighth International Symposium*, pages 1–4. Springer-Verlag, 1998.
12. R. Ghrist and D. Koditschek. Safe cooperative robot patterns via dynamics on graphs. In Yoshiaki Shirai and Shigeo Hirose, editors, *Robotics Research: the Eighth International Symposium*, pages 81–92. Springer-Verlag, 1998.
13. Eric Klavins, Daniel E. Koditschek, and Robert Ghrist. Toward the regulation and composition of cyclic behaviors. In Bruce R. Donald, editor, *Algorithmic Foundations of Robotics*, pages 205–220. A.K. Peters, 2000.
14. Eric Klavins, Haldun Komsuoglu, Daniel E. Koditschek, and Robert J. Full. Coordination and control for locomotion. In Joseph Ayers, Joel Davis, and Alan Rudolph, editors, *Neurotechnology for Biomimetic Robots*, pages 351–382. MIT, 2000.
15. John Hollerbach and D. E. Koditschek. Editorial - special issue on the ninth international symposium of robotics research. *Int. J. Rob. Res.*, 20(10):779–780, 2001.

Sample of Invited (Non-refereed) Publications

1. Daniel E. Koditschek. Lyapunov analysis of robot motion. In *Proceedings of a Tutorial Workshop, IEEE Conference on Robotics and Automation*, Raleigh, NC, Apr 1987. IEEE Society on Robotics and Automation, IEEE.
2. Daniel E. Koditschek. Adaptive techniques for mechanical systems. In *Fifth Yale Workshop on Applications of Adaptive Systems Theory*, pages 259–265, New Haven, CT, May 1987. Center for Systems Science, Yale University.
3. F. Levin, M. Bühler, and D. E. Koditschek. The Yale Real-Time Distributed Control Node. In *Second Annual Workshop on Parallel Computing*, Portland, Ore., Apr 1988. Oregon State University.
4. Louis L. Whitcomb, M. Bühler, and D. E. Koditschek. Preliminary experiments real-time distributed motion control. In *Proc. North American Transputer Users Group*, NY, Oct 1988.
5. D. E. Koditschek. Natural control in manufacturing. In *Proc. NSF Manufacturing Systems Research Conf.*, Berkeley, CA, Jan 1989. UC Berkeley Office of Continuing Education in Engineering.
6. Daniel E. Koditschek. Task encoding for autonomous machines: The assembly problem. In *Sixth Yale Workshop on Adaptive and Learning Systems*, pages 231–236, New Haven, CT, Aug 1990. Center for Systems Science, Yale University.

7. Daniel E. Koditschek. Hierarchical feedback controllers for robotic assembly. In *Seventh Yale Workshop on Learning and Adaptive Systems*, pages 205–211, New Haven, CT, May 1992. Yale University.

8. D. E. Koditschek. The geometry of a robot programming language. In K. Goldberg, D. Halperin, J.C. Latombe, and R. Wilson, editors, *The Algorithmic Foundations of Robotics*. A. K. Peters, Boston, MA, 1995.

9. F. Levin, M. Bühler, L. Whitcomb, and D. E. Koditschek. Transputer computer juggles real-time robotics. *Electronic Systems Design*, 19(2):77–82, Feb 1989.