David M. Auslander
Professor of the Graduate School, Mechanical Engineering
University of California at Berkeley

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Employment

University of California at Berkeley, Associate Dean for Student Affairs and Research, College of Engineering, 1999 – 2005, Acting Dean, College of Engineering, 2002-03
University of California at Berkeley, Professor of the Graduate School: joined faculty in 1966 - present
Northern Research and Development Corp., Cambridge, MA: Senior Engineer, 1961-64

Education

BSME   The Cooper Union, 1961
SM   Massachusetts Institute of Technology, 1964
ScD   Massachusetts Institute of Technology, 1966

Areas of Research

Control system design and analysis, real time software methodology, mechatronics (mechanical system control), motion control, energy management systems, dynamic system modeling and simulation

Visiting Positions

University of Tokyo, Center for Advanced Studies of the National Polytechnic Institute (Mexico), Princeton University, University of Sydney, École Nationale Supérieure des Arts et Métier (Paris), École Polytechnique Federale de Lausanne

Teaching

Taught classes in mechatronics, real time software, feedback control systems; Developed mechatronics sequence (undergraduate and graduate courses in real time software, digital and analog electronics, mechanical system control); Co-Developed new introductory feedback control course; Developed measurement and instrumentation course; Authored and co-authored textbooks in these areas; Developed robotics-mechatronics course at Univ. of Calif., Merced. Not currently teaching.

Professional Activities

International Federation of Automatic Control (IFAC) 1996 Triennial Congress, Conf. Mgr.
ASME Dynamics Systems and Control Division, chair 1981, member of various committees
ASME Transactions, J. Dynamic Systems, Measurement and Control, Editor 1981-86

Consulting: legal consulting; co-founder and Senior Consultant of Berkeley Process Control, Inc., a developer of controllers for mechanical systems. Berkeley Process Control was acquired by Moog, Inc., in 2008; member, Board of Directors and consultant, XIO, Inc(2014-2021).

Honors

Louis Levy Award (best paper), Franklin Institute (twice)
Fellow of the American Society of Mechanical Engineers
Education Award, Dynamic Systems and Control Division, ASME
Education Award, American Automatic Control Council
Control Practice Award, Dynamic Systems and Control Division, ASME
Donald P.Eckman Award of the Instrumentation, Systems, and Automation Society (ISA)
Mechatronics and Embedded Systems and Applications (MESA), ASME/IEEE, Career Award

David M. Auslander
Mechanical Engineering Department
University of California at Berkeley

Books and Book Chapters

1. Y. Takahashi, M. Rabins, D. M. Auslander, *Control and Dynamic Systems*, Addison-Wesley Publishing Company, 800 pages, 1970. (Also translated into Japanese and Polish.)

2. D. M. Auslander, Y. Takahashi, M. Rabins, *Introducing Systems and Control*, McGraw-Hill, New York, 388 pages, 1974. (Also translated into Spanish.)

3. A. Al-Shaikh, D. M. Auslander, editors, *Case Studies in Computer Control*, ASME, 1978, 87 pages.

4. D. M. Auslander, P. Sagues, *Microprocessors for Measurement and Control*, Osborne/McGraw-Hill, 1981, 310 pages. (Also translated into Japanese and Chinese.)

5. I.D. Landau, M. Tomizuka, D. M. Auslander, editors, *Adaptive Systems in Control and Signal Processing 1983, Pergamon Press*, Oxford, 1984.

6. D.M. Auslander, C.H. Tham, *Real-Time Software for Control,* Prentice-Hall, Englewood Cliffs, NJ, 1990, 493 pages.

7. D.M. Auslander, C.H. Tham, "Real-Time Control Software for Manufacturing Systems", Chapter in: *Advances in Manufacturing and Automation Systems*, Academic Press, 1991.

8. A. Jana, D.M. Auslander, "Workcell Programming Language for Intelligent Manufacturing Systems," chapter 1 in *Design and Implementation of Intelligent Manufacturing Systems*, Edited by H. R. Parsaei, M. Jamshidi, Prentice-Hall, Upper Saddle River, NJ, 1995, pp 1-18.

9. D.M. Auslander, C.J. Kempf, *Mechatronics: Mechanical System Interfacing*, Prentice-Hall, Upper Saddle River, NJ, 1996, 242 pages.

10. D.M. Auslander, J.R. Ridgely, J.C. Jones, "Real-Time Software for Implementation of Feedback Control," chapter in: *The Control Handbook*, edited by William S. Levine, CRC Press and IEEE Press, pp 323-344, 1996.

11.   D.M. Auslander, J. R. Ridgely, J. D. Ringgenberg, *Control Software for Mechanical Systems: Object Oriented Design in a Real-Time World*, Prentice-Hall, Upper Saddle River, NJ, 2002, 339 pages.

12.   D.M. Auslander. "Digital Controllers," chapter in *Encyclopedia of Physical Science and Technology (Third Edition)*, Academic Press, 2003, pp 441–460.

13.   D.M. Auslander, J-D Decotigne, "Network Fundamentals," chapter in *Handbook of Networked and Embedded Control Systems,* edited by D. Hristu-Varsakelis and W. S. Levine, Birkhauser, pp 197-223, 2005.

Journal and Conference Papers

1.   D. B. Spalding, D. M. Auslander, and T. R. Sundaram, "The Calculation of Heat and Mass Transfer through the Turbulent Boundary Layer on a Flat Plate at High Mach Numbers, with and without Chemical Reaction," *Supersonic Flow, Chemical Processes and Radiative Transfer*, Pergamon Press,211-276, 1964.

2.   D. M. Auslander, "Distributed System Simulation with Bilateral Delay-Line Models," *Trans. ASME, J. of Basic Engineering*, 90, 195-200, 1968.

3.   D. M. Auslander, "Simulation and Design of Fluidic Systems with Long Lines, "ASME paper #68-WA/AUTO-12, 1968.

4.   D. M. Auslander, and D. C. Sharma, "Study of Certain Clinical Disorders Related to the Biosynthesis and Regulation of Steriod Hormones by Computer Simulation," *Progress in Cybernetics, Gordon and Breach*, 467-490, 1970.

5.   G. F. Oster, D. M. Auslander, "Generalized Circuits for Thermodynamic Systems," Proc. of the 1970 International Conference on Circuit and System Theory, Kyoto, Japan, 161-162, 1970.

6.   Y. Takahashi, C. S. Chan, and D. M. Auslander, "Parameter Tuning of Linear DDC Algorithms," ASME paper #70-WA/AUT-16, 1970. Also published as: "Parametereinstellung bei linearen DDC-Algorithmen," *Regelungstecknik und Prozess-Datenverarbeitung*, 6, 237-244, 1971.

7.   D. P. Garg, D. M. Auslander, and M. J. Rabins, "A Synthesis Technique for Nonlinear Control Systems Using a Frequency Domain Stability Criterion," *Trans. ASME,J. of Basic Engineering*, 92 348-354, 1970.

8.   D. M. Auslander, "Distributed-Parameter Models for Continuous-Time Systems," Proc. of the 1970 Summer Computer Simulation Conference, Denver, Colorado, 242-251, 1970.

9.   D. M. Auslander, "Evolutions in Automatic Control," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 93, 4-9, 1971.

10.   R. W. Phillips, D. M. Auslander, "The Electro-Plastic Flow Modulator," First Symposium on Flow, Its Measurement and Control, 1243-1251, 1971 (Proceedings published in 1974).

11.   G. F. Oster, D. M. Auslander, "Topological Representations of Thermodynamic Systems,Part I - Basic Concepts," *Journal of the Franklin Institute*, 292,1-17, 1971.

12.   G. F. Oster, D. M. Auslander, "Topological Representations of Thermodynamic Systems,Part II - Some Elemental Subunits for Irreversible Thermodynamics," *Journal of the Franklin Institute*, 292, 77-92, 1971.

13.   D. M. Auslander, D. G. Chong and Y. Takahashi, "Optimal Digital Kalman Filtering for Systems with Continuous Input Noise," ASME Paper #71-WA/AUT-21, 1971.

14.   D. M. Auslander, T. E. Lobdell and D. G. Chong, "A Large-Scale Model of the Human Cardiovascular System and its Application to Ballistocardiography," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 94, 230-238, 1972 (also, *Bibl. Cardiov.* 32: 15-21, Karger, Basel,1973).

15.   D. M. Auslander, G. F. Oster, A. Perelson, and G. Clifford, "On Systems with Coupled Chemical Reaction and Diffusion," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 239-248, 1972.

16.   G. F. Oster, D. M. Auslander, "The Memristor: A New Bond Graph Element," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 94, 249-252, 1972.

17.   D. M. Auslander, "A Structured-Data Interactive Dynamic System Simulation Language Suitable for Mini-Computer Implementation," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 96, 261-268, 1974.

18.   D. M. Auslander, G. F. Oster, C. F. Huffaker, "Dynamics of Interacting Populations," *Journal of the Franklin Institute*, 297, 345-375, 1974.

19.   D. M. Auslander, N. T. Tsai, F. Farazian, "Bond Graph Models for Torsional Energy Transmission," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 97, 53-59, 1975.

20.   Y. Takahashi, D. M. Auslander, "Simple Discrete Control of Industrial Processes," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 97, 354-361, 1975.

21.   G. F. Oster, D. M. Auslander, T. T. Allen, "Deterministic and Stochastic Effects in Population Dynamics," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 98, 44-48, 1976.

22. D. M. Auslander, "Specifications for a Simulation Language for Population Ecology," Proceedings, 8th AICA Congress, 421-427, 1976.

23. D. M. Auslander, "Nonlinear Differential Equation Solving in the Engineering Curriculum," *Engineering Education* (Journal of the American Society for Engineering Education), 67, 1977.

24. D. M. Auslander, M. Tomizuka, Y. Takahashi, "Process Control Experience and a Self-Tuning Method for a Finite-Time Settling Controller/Observer," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 99, 209-210, 1977.

25. S. Abedi-Hayati, D. M. Auslander, "Control of a Single-Actuator Shaking Table, " ASME Paper #77-WA/Aut-11, 1977.

26. D. M. Auslander, Y. Takahashi, M. Tomizuka, "Direct Digital Process Control: Practice and Algorithms for Microprocessor Application," *Proc. of the IEEE*, 66, 199-208, 1978.

27. D. M. Auslander, "A Continuous-System Simulation Language Designed for LSI Economics," *Mathematics and Computers in Simulation*, XX,308-313, 1978.

28. D. M. Auslander, J. Guckenheimer, G. F. Oster, "Random Evolutionarily Stable Strategies," *Theoretical Population Biology*, 13, 276-293, 1978.

29. M. Tomizuka, D. M. Auslander, Y. Takahashi, "Simple Finite-Time Settling Control and Manipulated Variable Softening for Reverse-Reaction, Overshoot, and Oscillatory Processes," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 100, 50-58, 1978.

30. M. Tomizuka, D. M. Auslander, Y. Takahashi, "A Tutorial Introduction to Discrete-Time Optimal Control," ASME Paper #78-WA/DSC-18, 1978.

31. D. R. Gunewardana, M. Tomizuka, D. M. Auslander, "Application of Optimal Preview Control to Power Plant Cooling Systems," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 101, 162-171, 1979.

32. D. M. Auslander, M. Tomizuka, H. Lee, "An Optimal Standard for Solar Heating Systems," *Trans. ASME, J. Dyn. Sys., Meas. and Control*, 101, 138-149, 1979.

33. S. Abedi-Hayati, D. M. Auslander, "Control of Multi-Actuator Electro-Hydraulic Shaking Tables," *Fluidics Quarterly*, 11, 1-16, 1979.

34. D. M. Auslander, D. A. Dornfeld, P. Sagues, "Software for Microprocessor Control of Mechanical Equipment," Proc. of the Joint Automatic Control Conference, June, 1979, Denver, Colorado.

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