

DR. CELAL BATUR
6/30/2019

Expertise:

Process identification and control applied to diagnostics, health monitoring, crystal growth control , motion control and polymeric systems.

DEGREES IN FIELD

Ph.D. In Process Modeling and Control, University of Leicester, England, 1976.

B. Sc. and M.Sc. in Mechanical Engineerig. Technical University of Istanbul, Turkey
1970, 1971.

EXPERIENCE

- 2011- Director of NSF, Industry University Cooperative Research Center.
- 1999-2013 Prof. and Chair of Mechanical Engineering
- 1994- Prof. of Mechanical Eng. Univ. of Akron, Akron-Ohio.
- 1984-1994 Assoc. Prof. of Mechanical Eng. Univ. of Akron, Akron-Ohio.
- 1982-1984 Chief Engineer and Partner, Vacuum Plast, Istanbul, Turkey.
- 1980-1982 Visiting Prof. of Mechanical Eng. Univ. of Akron, Akron-Ohio.
- 1976-1980 Assist. Prof. of Mechanical Eng. Technical Univ. of Istanbul, Turkey.

EXPERIENCE IN TEACHING

A. GRADUATE COURSES INTRODUCED AND TAUGHT

- 1. 4600-645 Process Identification and Computer Control
- 2. 4600-646 Expert Systems in Controls and Manufacturing
- 3. 4600-544 Robotics, Design, Controls and Application
- 4. 4600-642 System Analysis and Controller Design
- 5. 4600-697 Neural and Fuzzy Control Systems
- 6. 4600-541 Control System Design

B. UNDERGRADUATE COURSES TAUGHT

- 1. 4600-203 Dynamics
- 2. 4600-440 System Dynamics and Control
- 3. 4600-444 Robotics, Design, Controls and Application
- 4. 4600-305 Thermal Science
- 5. 4600-483 Measurement Laboratories
- 6. 4600-401 Design of Energy Systems
- 7. 4600-461 Design of Mechanical Systems
- 8. 4600-380 Engineering Analysis
- 9. 4600-340 System Dynamic and Response
- 10. 4600-441 Control System Design

9. Neural Networks
Haiyan Zhang, December 1991
10. Robust Controller Design for the Crystal Growth Furnace
Chang-Rae Lee, Summer 1992
11. Optimization by Neural Networks
Karaman Mahmut, Summer 1993.
12. Fuzzy Control
M. Crapo, Spring 1992.
13. Stereo Particle Tracing
V. Purushhothaman, Summer 1993.
14. Process Control
Mike Michaud
15. Artificial Intelligence for Controls
Joseph Saus
16. Computerized Force Control of a Pneumatic Robot Gripper
G. Namala, Jan. 1993
17. Computer Interface for High-Torque Stepping with an AC Synchronous Motor
M. Jayaram, Jan. 1993
18. Life and Reliability Analysis of Aircraft Transmission
M.G. Prasanna, Jan. 1993
19. Computerized Cold Forming in Scale
P. Shah, Jan. 1992
20. Computer Controlled Cold Forming for Circular Plate
S. Krishnaswami, Jan. 1991
21. Controlled Indexing Dynamics Using Computer Pulsed Stepping Motors
R.J. Knorr, Jan. 1984
22. Self-tuning rubber cut control
Michael E. Wroe 1992
23. Projective Control
A. Srinivassan, Fall 1993
24. Stability of Fuzih, Jil 1993

11. Choy, F K., Padovan, J., Batur, C., "Rub Interactions of Flexible Casing Rotor Systems with Base Excitations", ASME Journal of Engineering for Gas Turbines and Power, Vol. 111, No 4, pp: 652-659, October 1989.
12. Batur, C., Braun, M.J., "Measuring Flow With Machine Vision", Intech., Intern. Journal of ISA, Vol. 36, No. 2, 1989.
13. Hete, B.F., Savage, M., Batur, C., "A High Pressure Portable Pneumatic Drive Unit", Journal of Artificial Organs, Vol. 13, No. 6, 1990, pp. 539-545.
14. Braun, M.J., Batur, C., "Non-Intrusive Laser Based Full Field Quantitative Flow Measurements Aided by Digital Image Processing, Part 2: The Case of Hydrostatic Bearing," , Journal of Tribology International, pp. 277-289, Vol. 13, 1991.
15. Batur, C., Kasparian, V., "Predictive fuzzy expert controllers", International Journal of Computers and Industrial Engineering. Vol. 20, No. 2, pp. 199-209, 1991.
16. Batur, C., Srinivasan, A., Chan, C.C., "Automated Rule Based Model Generation for Uncertain Complex Dynamic Systems", Journal of Engineering Applications of Artificial Intelligence, Vol. 4 , No.4, May 1991.
17. Batur, C., "Process modeling by neural nets", Journal of Modelling and Scientific Computing, submitted..
18. Batur C., Kasparian, V., "Adaptive Expert Control", International Journal of Control, Vol. 54, Number 4, pp. 867-881, 1991.
19. Batur, C., Kasparian V., "Model based fuzzy control", Journal of Mathematical and Computer Modeling, Pergamon Press, Vol. 15, No. 2. pp. 3-15, 1992.
20. Batur, C., Sharpless, R. B., Duval, W.M.B , Rosenthal, B.N., "Self-tuning multivariable Pole Placement Control of Multizone Crystal Growth Furnace", Journal of Adaptive Control and Signal Processing, Vol. 6, pp. 111-123, 1992.
21. Batur, C., Sharpless, R B, Duval, W.M.B, Rosenthal, B.N., Singh, N B, "Identification and Control of a Multizone Crystal Growth Furnace", Journal of Crystal Growth, 119, pp. 371-380, 1992.
22. Batur C., Kasparian, V., "Fuzzy Adaptive Control", International Journal of Systems Science, Vol. 24, No.2, 301-314, 1993.
23. Srinivasan, A., Batur, C., "Fault Detection and Isolation in Unsupervised Learning Environment", Journal of Pattern Recognition Letters, 15, 235-242, March 1994.

Leephakpreeda, T, Batur, C., “ Distributed Crystallinity Control During Cast Film Extrusion”, International Polymer Processing, Vol. XII, December 1997, pp. 373-377, 1997.

Leephakpreeda, T, Batur, Celal., “Stability Analysis of Fuzzy Control System”, Thammasat Int. Journal. Vol. 2, No. 1, pp1-6, 1997.

39. Kasparian, V., Batur C., “Model Reference Based Neural Network Adaptive Controller”, ISA Transactions, Volume 37, No.1, pp. 21-39, 1998.

40. Batur, C., Duval, M. B. W., Bennett, R. J., “ Control and design of crystal growth furnace”, ISA Transactions 38, pp. 73-85, 1999.

41. Leephakpreeda,T. and Batur, C. (1997). A Design Sensitivity Analysis for Crystallinity Control,Thammasat International Journal of Science and Technology, Vol. 2, No. 2, pp. 18-23.

42. Leephakpreeda,T. and Batur, C. (1997). A Design Sensitivity Analysis for Crystallinity Control, Thammasat International Journal of Science and Technology, Vol. 2, No. 2, pp. 18-23.

43. Leephakpreeda,T. and Batur, C. (1997) Modelling of Local Crystallinity in Polymer Extrusion Process, Research and Development Journal of The Engineering Institute of Thailand, Vol. 7, No. 2, pp. 76-81.

44. Leephakpreeda,T. and Batur, C. (1997). Stability Analysis of a Fuzzy Control System, Thammasat International Journal of Science and Technology, Vol. 2, No.1, pp 1-5.

45. Batur, C. and Leephakpreeda,T.(1996). Optimization of Crystallinity Distribution in Sheet Extrusion, Journal of Inverse Problems in Engineering, Vol. 4, pp. 153-176.

46. Batur, C., Vhora, M. H., Cakmak, M., Serhatkulu, T. “ On line crystallinity measurement using laser Raman spectrometer and neural network”, ISA Transactions, 38, pp. 139-148, 1999.

47. Batur, C., Srinivasan A., Duval, W. M. B, Singh, N. B., Golovaty, D., “ On line control of solid liquid interface by state feedback, Journal of crystal growth, 205, pp 395-409, 1999.

48. Nizami, J., Batur, C., Nizami, J., Batur, C., “Stability Analysis and Controller Design for Polymer Sheet Extrusion” Journal of Vibration and Control, 6, 1083-1105, 2000.

49. Seidensticker, R.G., Rosch, W.R., Mazelsky, R., Hopkins, R.H., Singh, N.B., Coriell, S.R., Duval, W.M.B., Batur, C” Active control of interface shape during crystal growth of lead bromide”, In

Part I, Journal of System and Control Engineering 2008, 222(I8), 839-849. [DOI: DOI 10.1243/09596518JSCE565], also in



73.

4. Batur, C., "Teaching the Analytical and Experimental Techniques on Microprocessor Based System Identification", Proceedings of the ASEE pp. 197-202, 1981. Published by the American Society of Engineering Education.
5. Batur, C., "On Line Identification of an Electrically Heated Liquid Delivery System", 12th Conference on Modeling and Simulation, ISA and IEEE publication, pp. 26-31, 1981.
6. Kaya, A., Batur, C., "Microprocessor Controlled Electric Process Heater", Proceedings of 1981 Joint Automatic Control Conference, JACC Vol. 11. Paper TP-2A.
7. Kaya, A., Dinibutun, T.A., Batur, C., Hizal, A., "Modeling of a Test Chamber for the Optimal Control of Environmental Conditions", Modeling and Simulation, Vol. 11, pp. 661-665, 1980. Published by ISA and IEEE.
8. Batur, C., "A Modified Algorithm for the Least Squares Identification", The ASME Winter Annual Meeting, paper no: 82-WA/DSC-9, 1982.
9. Batur, C., "How to Stabilize the Smith Control Scheme Despite Modeling Errors", 13th Conference on Modeling and Simulation. Modeling and Simulation, published by ISA and IEEE, pp. 127-129, 1982.
10. Batur, C., "Teaching Experimental Techniques for Microprocessor Based Digital Control", Proc. of the ASEE, pp. 99-102, 1982.
11. Batur, Celal., "A New Self-Tuning Controller for Dead Time Systems", 16th Confe

14. Batur, Celal., "Practical Robust Self Tuning Controllers", ISA International Conference. Conf. proceed., paper 86-2684, Vol.41, Part 1, pp. 567-574, Houston Texas, 1986, published by ISA.
15. Batur, Celal., "Stable Sub-optimum Controllers for the Smith Dead Time Compensation", American Control Conference (ACC), June 18-20 1986, Seattle, Washington, Proceedings of ACC, pp. 1354-1358. Paper No: 86CH2336-6.
16. Batur, Celal., Braun, M.J., "Microprocessor Implemented Sub-Optimum Smith Controllers for Temperature Control", IFAC Symposium on Microcomputer Application in Process Control, Conf. Proceed. pp. T7/1-5, July 22-25, 1986. Series editor E. Adali. Istanbul, Turkey.
17. Batur, Celal., "Application of Robust Self-Adaptive Control Strategies by Personal Computers", 17th Modelling and Simulation Conference. Modelling and Simulation, Vol.17, pp. 913-918, 1986, Published by ISA and IEEE.
18. Batur, C., Braun, J.M., Shaffer, T., Rose, B., "Computer Based Flow Visualization as an Instructional Tool for Fluid Dynamics", Proceedings of the 1987 Annual ASEE Conference, pp. 1-6. Published by the American Society of Engineering Education.

23. Batur, Celal., "Self Tuning Based Identification and Control of Smith Control Systems", ASME Winter Annual Meeting, Miami Beach Florida. 85-WA/DSC, Vol. 1 pp. 185-188, published by ASME, 1985.

24. Batur, Celal., "Teaching Statistical Process Identification with Low Cost Computers", Proc. of ASEE-North Central Se

paper 88-1441, pp. 261-266, published by ISA. This paper received the second best paper award.

33. Mussivand, T., Navarro, R.P., Chen, J., Batur, C., McMillin, C.R., "Artificial heart instrumentation for fluid dynamic analysis", ISA/88 Proc of the International Conf. of the ISA. Published in conf. proceedings. Paper 88-1442, pp. 267-276, 1988.

34. Batur, C., Braun, M J., "Flow Measurement with Non-intrusive Machine Vision", Proc. of the ISA-88, pp. 261-266. Published by the Instrument Society of America 1988.

35. Batur, C., Kasparian V.S., "Model Based Self Tuning Expert Control " Proceedings of the Robex 89, the annual workshop on robotics and expert systems. ISA Vol 4. pp 177-183, 1989, ISA Paper #89-0382.

36. Batur, C., Kasparian V.S., " Application of a fuzzy expert controller to speed regulation", Modelling and Simulation Vol. 20 Part 5. pp: 2205-2209. Published by IEEE and ISA, 1989.

37. Batur, C., Kasparian V.S , " Self-organizing model based expert controller", Proceedings of the IEEE International Conference on Systems Engineering. TCH 2767-2-89 IEEE, pp. 411-415. IEEE Catalog No: 89CH2767-2, 1989.

38. Batur, C., Kasparian V.S., " Intelligent Fuzzy Expert Control", Dynamic Systems and Control, DSC-Vol. 16, pp. 1-6. The American Society of Mech. Eng., 1989.

39. Batur, C., Kasparian V.S., "Application of a self-tuner using fuzzy control technique", Proceedings of the Second International Conf. on Industrial Engineering Applications. Vol. 1, pp. 235-244, 1989. Paper 1989 ACM, 0-89791-3205.

40. Batur, C., Kasparian, V.S., " A Real Time Self-Tuning Fuzzy Control", Proceedings of the 1989 American Control Conference, pp 1810-1815, Volume 2. Published by the American Control Council. IEEE Catalog number 8984415.

41. Sharpless, R.B., Batur, C., Duval, W.M.B, Rosenthal, B.N., Singh, N.B., "Computer imaging based detection and quantification of solid-liquid interface during crystal growth.", ASME publication MD, Vol. 21, pp. 39-53, edited by Wang, H.P., 1990.

42. Batur C., Sharpless, R., Duval, W M.B., Rosenthal, B., Singh, N.B., "Solid-Liquid Interface Profile Control for Transparent Multizone Bridgman Type Crystal Growth

Furnaces", Proceedings of the ISA 90 International Conference, paper #90-510 0065-2814/90/921-927, Volume 45. pp. 921-927, 1990.

43. Batur, C., Srinivasan, A., "Estimation of dynamic system parameters by neural networks", Proceedings of th

52. Srinivasan, Arvind., Batur, Celal., "Hopfield/Art-

62. Batur, Celal., Leephakpreeda, T, "Control of Crystallinity in Polymer Extrusion Processes", 13th IFAC, World Congress, Volume M, pp. 169-175, 1996.
63. Batur, Celal., Leephakpreeda, T, "Crystallinity Control During Sheet Extrusion", ASME WAM, MD- Vol 74, pp. 147-149, 1996.
64. Javeed, Nizami., Celal Batur., "Stabilizing Controller for Polymer Sheet Extrusion", Proceedings of the 36th IEEE Conference on Decision and Control, ISBN: 0-7803-4187-2, Volume 3 No 5, pp.2543-2545, 1997.

73. Karaman, M., Batur, C., “Draw Resonance Controller for Polymer Fiber Spinning Process”, Proc. of The American Control Conference, pp. 2155-2160, ISBN 0-7803-4530-4, 1998.

74. Walter M. B. Duval., Celal Batur., Robert J. Bennett., “ The Design of a Transparent Vertical Multizone Furnace: Application to Thermal Field Tuning and Crystal Growth”, NASA /TM- 1998-207412.

75. Batur, C., Vhora, M. H., Cakmak, M., Serhatkulu, T. “ On line crystallinity measurement using laser Raman spectrometer and neural network”, ASME. 1998. Presented in the symposium for Phase Transitions in Polymer Processing.

76. Batur, C., Duval, W.M.B., Bennett, R., “Performance of Bridgman furnace operating under projective control” , American Control Conference, ISBN 0-7803-4990-6/99@ACC, 4101-4105, 1999.

83. Ergungor Z., Cakmak M., Batur C., Conditions on the Development of Morphology in Clay Nanoparticles Filled Nylon-6 Fibers", in SPE Antec Proceedings,, Vol. 2, Materials, pp:2280-2284, 2002.

84. G. Song, V. Chaudhry, and C. Batur, "Neural Network Tracking Control of a Shape Memory Alloy Wire Actuator Without a Position Sensor" , Proceedings of the ASME Winter Annual Meeting, 2001, IMECE2001/AD-23738.

85. Batur, Celal., Tawfik, M. "Projective Control of Electro Hydraulic Servo Systems", Proceedings of the 2001 American Control Conference, ISBN 0-7803-6495-3/01@2001ACC, pp:576-581.

86. W.M.B. Duval, C. Batur., H. Zhong, "Transient Mixing Driven by Buoyancy Flows", Proceedings of the ASME IMECE, Paper Number IMECE2002-33280.

A totally implanted, self-contained, prosthetic bladder. Funded by the Akron City Hospital and the University of Akron, RG-925 \$2,855. Additional contributions: \$2,000 Akron City Hospital, \$2,000 College of Engineering ,with M.J. Braun, K. Mudry, J. Summers, 1986.

\$ 6,885

Equipment grant from the Department of Energy, Grant No: OR-62, 1987.

\$ 6,990

A non-intrusive flow visualization method for thin film technology. NAG3-675 (Co-PI). For the period 12/29/86 through 12/28/87.

\$ 70,693

Equipment grant for robotics laboratories, Nordson Corporation, Ohio, 1988.

\$ 55,000

Equipment grant from NASA, 1988.

\$ 7,619

A non-intrusive flow visualization method for thin film technology, NASA Grant 3-675. \$71,276. University of Akron matching fund \$15,000. December 87-December 88 (Co-PI).

\$ 86,276

Temperature and melt/solid interface control during crystal growth, NASA Grant, PI, 1988.

\$ 41,382

Support for the Motion and Control Lab. from Parker 1999-2001

\$40,000

Equipment grant for machine vision components and software for the robotics Lab. True Vision Company, 1988.

\$ 2,000

Adaptive control of interface by temperature and interface profile feedback in transparent multi-zone crystal growth furnace NASA, PI, 1989.

\$ 18,920

Further study on adaptive control of interface by temperature and interface profile feedback in transparent multi-

	\$ 70,000
Stereo imaging of interface shape during crystal growth in transparent furnaces, NASA, PI, 1991.	
	\$ 44,743
Multivariable adaptive control of interface for programmable multizone crystal growth furnace, NASA, PI 1991.	
	\$ 32,593
Data acquisition equipment, private donation April, 1991.	
	\$ 5,000
Stereo Imaging Based Particle Velocimeter, NASA Grant NCC3-231, PI, September 1991.	
	\$ 15,800
Program Excellence Grant. Computational Mechanics Group (A member of Computational Mechanics Group, first year funding).	\$ 340,000
Parker Hannifin Fluid Power Laboratory Support (Co-PI), 1992.	
	\$ 70,000
A Nasa Grant on, On-line Quantification of Crystal Surfaces by Stereo Imaging. June 1992, PI.	
	\$ 11,633
An Intelligent Control Methodology for Programmable Multizone Crystal Growth Furnaces, a supplemental fund, NASA 1992.	
	\$ 1,000
A Nasa Grant on, An Intelligent Control Methodology for Crystal Growth, 1/28/92, PI.	
	\$ 33,112
A Nasa Grant on, Crystal Growth Control, 2/28/93, PI.	
	\$ 36,498
A Nasa Grant on, Crystal Growth Control, 8/16/94, PI.	
	\$ 10,000
Hierarchical Structure Control of Polymer Sheet Casting Process Through Adaptive Control, Co-PI, US Army, 1994.	
	\$ 117,500
A Nasa Grant on Crystal Growth and Mixing Control, 1996, PI.	

Support for Parker Motion Control Lab., 2006,Parker Hannifin.	\$2,000
Support for Parker Motion Control Lab., 2007,Parker Hannifin.	\$12,000
Support for Parker Motion Control Lab., 2008,Parker Hannifin.	\$5,000
Support for Parker Motion Control Lab., 2009,Parker Hannifin.	\$37,000
Support from Delphi for ME Department	\$642,550
Software Support (NX5) from Siemens for the ME Department, 2008-2009	\$2,000,000
NSF, I-UCRC Planning, 2010	\$10,000
NSF, I-UCRC, 2011-2012	\$48,852
NSF, I-UCRC, 2012-2013	\$55,000
NSF, I-UCRC, 2013-2014	\$52,000
NSF, I-UCRC, 2014-2015	\$55,000
NSF, I-UCRC, 2014-2015	\$55,000
NSF, I-UCRC, Phase II 2015-2022	\$500,000
Oxide Based Heterointerfaces for Extreme Environment Electronics, CASE/AFOSR, 2012	\$34,625
LuK- Lubrizol Wet Friction (Co-PI) 2012 2013	\$90,000

B. INTERNALLY FUN E RESEARCH PROJECTS

\$ 3,500

\$ 2,400

\$ 2,100

\$ 12,750

\$ 12,750

\$ 2,100

