
BIOGRAPHICAL SKETCH

NAME Skliar, Mikhail		POSITION TITLE Associate Professor	
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR	FIELD OF STUDY
Odessa Technical University, Odessa, Ukraine	MS	1986	EE/Control
National Technical University (KPI), Kiev, Ukraine	Candidate of Science	1991	Control in Technical Systems
University of Colorado, Boulder, CO	PhD	1996	Chemical Engineering/Control

A. Positions and Honors

RESEARCH AND PROFESSIONAL EXPERIENCE

- 1984-1985 Research Engr, Dept. Rule-Based Control, Institute of Economics, Ukrainian Academy Science
1984-1986 Research Assistant, Dept. of Industrial and Remote Control, Odessa Technical University
1986-1888 Junior Scientific Fellow, Dept. of Industrial & Remote Control, Odessa Technical University
1990-1991 Lecturer, Dept. of Mathematical Methods of System Analysis, Kiev Polytechnic Institute (KPI)
1988-1991 Senior Researcher, Dept. Math. Methods of System Analysis, Kiev Polytechnic Institute (KPI)
1992-1996 Research Assistant, NASA Specialized Center for Research & Training, University of Colorado
1996-present Assistant/Associate (2002) Professor, Department of Chemical Engineering, University of Utah

HONORS, AWARDS, RECOGNITION

Program Committee, 2009 American Control Conference; ScienceDirect [Top 25 Hottest Articles](#) in Material Science/Journal of Electrostatics; ScienceDirect [Top 25 Hottest Articles](#) in Chemical Engineering/Journal of Process Control; [Outstanding new research](#) published in *Phys. Med. Biol.* in 2005; Associate Editor, *IEEE Trans. Control Systems Tech.* (2002-2004); Advisor, Student Best Paper Award Finalist, 2003 American Control Conf; Established Investigator Award, American Heart Association, 2002; 2002 Best Paper, American Control Conference, Modeling & Control of Biological Systems; NSF CAREER Award, 1999; Best Paper, 1997 American Control Conf., On-line Monitoring & Fault Detection; Guest Editor, J. App. Mathematics & Computer Science, 1998; 13th World Congress of International Federation of Automatic Control NSF student's award, 1996; Outstanding Young Researcher, Kiev Polytechnic Institute, 1991; Member of the Program Committee of the IV International Industrial Control Conference, 1990; M.S.E.E. with Highest Honors, Odessa Technical University, 1986.

B. Selected peer-reviewed publications (in chronological order; out of 80+)

- 1-2. M. Z. Zgurovskiy and M. V. Skliar, "Multiscale Expansion of the Solution of a Singularly-Perturbed System of Evolutional Operator Equations. Part 1&2," J. Automation and Information Sciences, 24(5):61-71 and 24(6):18-29, 1993.
 3. M. Skliar and W. F. Ramirez "Implicit Kalman Filtering," Int. J. Control, 66:393-412, 1997.
 4. M. Skliar and W. F. Ramirez, "Air Quality Monitoring and Early Detection of the Air Contamination Events in Enclosed Environment," J. Spacecraft & Rockets, 34:522-532, 1997.
 5. M. Skliar and W. F. Ramirez, "Source Identification in the Distributed Parameter Processes," App. Math. & Comp. Science, 8:733-754, 1998.
 6. G. Giridharan and M. Skliar, "Non-Linear Controller for Ventricular Assist Devices," Artificial Organs, 26:980-984, 2002.
 7. D. Arora, M. Skliar, R. B. Roemer, "Model Predictive Control of Hyperthermia Treatments," IEEE Trans. Biomed. Eng., 49:629-639. 2002.
 8. M. Basin and M. Skliar, "Optimal Estimation & Control of Continuous Systems with Time-Varying Delays," K. Gu, C. Abdullah & S.-I. Niculescu (Eds.) *Time Delay Systems*, pp. 255-260, Pergamon Press, 2002.
 9. G. Giridharan, M. Skliar, D. B. Olsen and G. M. Pantalos, Modeling and Control of Brushless DC Axial Flow Ventricular Assist Device," ASAIO J., 48:272-289, 2002.
 10. M. Skliar and P. Tathireddy, "Approximation of Evolutional System Using Singular Forcing," Comp. & Chem. Engineering, 26:1013-1021, 2002.
 11. D. Arora, M. Skliar, R. B. Roemer, "Model Predictive Control of Hyperthermia Treatments," IEEE Trans. Biomed. Eng., 49:629-639. 2002.
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12. G. Giridharan and M. Skliar, "Control Strategy for Maintaining Physiological Perfusion with Implantable Rotary Blood Pumps," *Artificial Organs*, 27:639-648, 2003.
13. G. Giridharan and M. Skliar, "Non-Linear Controller for Ventricular Assist Devices," *Artificial Organs*, 26:980-984, 2002.
14. Y.-H. Choi and M. Skliar, "Quantitative Measurements of Dielectric Spectra with Microdielectric Fringe-Effect Sensors," *Anal. Chem.*, 76:4143-4149, 2004.
15. G.A. Giridharan, G.M. Pantalos, S.C. Koenig, K.J. Gillars and M. Skliar, "Physiologic Control of Rotary Blood Pumps: An In-Vitro Study," *ASAIO J.*, 50:403-409, 2004.
16. D. Arora, M. Skliar, and R. B. Roemer, "Minimum-Time Thermal Dose Control of Thermal Therapies," *IEEE Trans. Biomed. Eng.*, 52:191-200, 2005.
17. Y.-H. Choi, and M. Skliar, "Standard-Independent Estimation of Dielectric Permittivity with Microdielectric Fringe-Effect Sensors," *Anal. Chem.*, 77:871-877, 2005.
18. D. Arora, D. Cooley, T. Perry, M. Skliar and R. B. Roemer, "Direct Thermal Dose Control of Focused Ultrasound Treatments: Phantom and *In-Vivo* Evaluation," *Phys. Med. Biol.*, 50:1919-1935, 2005.
19. D. Arora, D. Cooley, T. Perry, J. Guo, A. Richardson, J. Moellmer, R. Hadley, D. Parker, M. Skliar and R. B. Roemer, "MR Thermometry-Based Feedback Control of Efficacy and Safety in Minimum-Time Thermal Therapies: Phantom and In-Vivo Evaluations," *Int. J. Hyperthermia*, 22:29-42, 2006.
20. G. Giridharan and M. Skliar, "Physiological control of blood pumps using intrinsic pump parameters: A computer simulation study," *Artificial Organs*, 30:301-307, 2006.
21. M. Basin, J. Perez, and M. Skliar, "Optimal Filtering for Polynomial System States with Polynomial Multiplicative Noise," *Int. J. Robust Nonlinear Control*, 16: 303-314, 2006.
22. D. Arora, M. A. Minor, M. Skliar and R. B. Roemer, "Control of thermal therapies with moving power deposition field," *Phys. Med. Biol.*, 51:1201-1219, 2006.
23. Y.-H. Choi, P. Tathireddy and M. Skliar, "Method for Measuring Thickness of Dielectric Films Using Microdielectric Fringe-Effect Sensors," *Anal. Chem.*, 78:3242-3248, 2006.
24. H. Zhang, M. Basin and M. Skliar, "Optimal State Estimation for Continuous, Stochastic, State-Space System with Hybrid Measurements," *IJICIC*, 2:357-370, 2006.
25. Y. Lee, M. Skliar, and M. Lee, "Analytical method of PID controller design for parallel cascade control," *J. Process Control*, 16:773-886, 2006.
26. H. Zhang, M. Basin and M. Skliar, "Itô-Volterra Optimal State Estimation with Continuous, Multirate, Randomly Sampled, and Delayed Measurements," *IEEE Trans. Automat. Control*, 52:401-416, 2007.
27. D. Arora, M. Skliar, D. Cooley and R. Roemer, "Constrained Predictive Control of Thermal Therapies for Minimum-Time Delivery of Thermal Dose," *IEEE Trans. Control Systems Technology*, 15:1030-1037, 2007.
28. M. Basin, J. Perez, and M. Skliar, "Optimal state filtering and parameter identification for linear systems," *Optim. Contr. Appl. Met.*, 29:159-166, 2008
29. M. Basin, D. Calderon-Alvarez, and M. Skliar, "Optimal Filtering for Incompletely Measured Polynomial States over Linear Observations," *Int. J. Adapt. Control and Signal Processing*, 22:482-494, 2008.
30. P. Tathireddy, Y.-H. Choi, M. Skliar, "Particle AC electrokinetics in planar interdigitated microelectrode geometry," *Journal of Electrostatics*, 66:609-619, 2008.
31. A. Blankespoor, A. Payne, N. Todd, M. Skliar, S. Roell, J. Roland, D. Parker, R. Roemer, "Model Predictive Control of HIFU Treatments in 3D for Treatment Time Reduction," *AIP Conf. Proc.*, 1113:215--219, 2009.
32. M. Kandadai, P. Mohan, G. Lin, A. Butterfield, M. Skliar, J. Magda, "Comparison of surfactants used to prepare aqueous perfluoropentane emulsions for pharmaceutical applications," *Langmuir*, 26:4655-4660, 2010.
33. A. Butterfield, R. Stewart, C. Schmidt, M. Skliar, "Bidirectional Power Stroke by Ncd Kinesin," *Biophys. J.*, 99: 3905-3915, 2010.
34. R. Niu & M. Skliar, "Identification of Controlled-Complexity Thermal Therapy Models Derived from Magnetic Resonance Thermometry Images," *PLoS ONE*, 6:e26830, doi:10.1371/journal.pone.0026830, 2011.
35. R. Niu and M. Skliar, "Identification of Reduced-Order Thermal Therapy Models Using Thermal MR Images: Theory and Validation," *IEEE Trans. Medical Imaging*, 31:1493-1504, 2012.
36. M. Shamsuzzoha, M. Skliar and M. Lee, "Design of IMC filter for PID control strategy of open-loop unstable processes with time delay," *Asia Pac. J. Chem. Eng.*, 7:93-110, 2012.
37. Y. Jia, M. Puga, A. Butterfield, D. Christensen, K. Whitty, and M. Skliar, "Ultrasound Measurements of Temperature Profile Across Gasifier Refractories: Method and Initial Validation," *Energy & Fuels*, 2013.

C. Research Support

Current

Established Investigator Award EIA-2003, (Skliar) 1/1/03- 12/31/08
American Heart Association / National Award
Physiologic Control of Implantable Blood Pumps
The major goals of this project are to develop and validate in in vitro and calf models the control algorithms for physiological control of implantable blood pumps.
Role: PI

Industrial partnership, (Parker/Roemer/Skliar) 1/1/06-12/31/08
Siemens Medical Solutions
Control of Safety and Efficacy of MRI-Guided Thermal Therapies
The objective of this project is to develop and validate a prototype of the clinical system for minimum time control of safety and efficacy of thermal therapies using ultrasound phased array.
Role: co-PI

Huntsman Cancer Institute Seed Grant, (Rapoport, Skliar) 1/5/07-12/31/08
HCI/University of Utah
Targeted Combination Therapy of Pancreatic Cancer by Micelle-Encapsulated Paclitaxel/Gemcitabine Combination and Focused Ultrasound
This study investigates a novel targeted drug delivery system based on multidrug-loaded thermally and ultrasound sensitive microbubbles and its testing in pancreatic cancer model
Role: co-PI

Synergy Grant (Parker/Roemer/Skliar) 10/1/07-9/30/09
University of Utah
Program Project in MRI-Guided Non-Invasive Ultrasound-Based Thermal Therapies
The intent of this grant is to provide support in obtaining preliminary data and team building effort in order to develop and submit NIH PPG application
Role: co-PI

Completed

CTS-0117300, Skliar (PI) 10/1/02-12/31/06
NSF
Ito-Volterra Integral Approach to Optimal Filtering and Control of Processes with Continuous, Discrete and Delayed Measurements
The major goal of this project is to develop the theory for optimal state estimation for continuous systems with discrete, continuous and delayed measurements.
Role: PI

R01 CA87785, (Roemer/Skliar/Parker/Christensen) 7/1/02-6/30/06
NIH / NCI
Optimization and Interactive Control of HIFU Therapy
The goal of this project is to develop and experimentally validate techniques to optimally plan and interactively control HIFU therapy.
Role: Co-PI

CTS-9875462, Skliar (PI) 6/01/99-5/31/03
NSF
CAREER: Online Estimation of MWD of Polymer Melts using Broad-Band Dielectric Measurements: Sensor Development and Control

The major goals of this project are to develop theory and sensor for on-line spatially resolved measurements of interfacial material properties and utilization of these measurements in real time control of product synthesis and processing.

Role: PI

DE-PS26-00FT40759, (Deo/Skliar)

6/01/99-5/31/03

DOE

Online, Optimization-Based Simulation of Fractured and Nonfractured Reservoirs

The major goal of this project is to develop the theory for optimal state estimation for continuous systems with discrete, continuous and delayed measurements.

Role: Co-PI

Pending

NIH, PAR-07-214, Roemer (PI)

Academic-Industrial Partnership to Develop Image-Guided Treatment Control System for High-Intensity Ultrasound Therapy of Breast Cancer Patients

In collaboration with Siemens Medical Systems, we proposed to develop and test innovative approach to ultrasound ablation of malignant breast tumors that guarantee safety and efficacy of the therapy, while simultaneously minimizing the treatment time.

Role: co-PI

NIH, Parker (PI)

Model-Based Reconstruction of Undersampled k -space Thermometry Measurements

This research will lead to the acceleration of thermal image acquisition used in the feedback of the thermal treatment automatic control system

Role: co-PI

NIH, PFA-EB-07-004, Skliar (PI)

Adaptive Model-Predictive Control of Thermal Therapies based on Undersampled MRI Measurements

The goals of this proposal (to be submitted in January 2008) is to develop methods for patient-specific model identification of thermal therapies with capabilities to dynamically adapt the identified model to account for changing thermal and acoustic properties due to elevated temperatures during ultrasound thermal therapies, and application of such models in automatic treatment control systems and model-based reconstruction of undersampled MRI data rapidly sampled to insure an adequate treatment monitoring and control feedback.

Role: PI

NIH, Skliar (PI)

Control of Perfusion and Drug Residence Time by Noninvasive Activation of Thermally and Ultrasound Responsive Microbubbles

This project (to be submitted in February 2008) is directed at the development of a therapies approach that utilize thermally and ultrasound responsive microbubbles to occlude blood flow in the target region or reduce drug washout from the target by control reduction of the blood flow.

Role: PI

NSF-07-603, Skliar (PI)

CDI Type II: Model Identification Methods for Knowledge Discovery and Model-Enabled Measurements

The goal of this proposal (pre-proposal submitted) is to develop theory, methods and software tool for simultaneous state and parameter identification in nonlinear stochastic system and demonstrate its application in several areas of science and engineering.

Role: PI