

CURRICULUM VITAE

1. BASILIS GIDAS

Professor, Division of Applied Mathematics
Brown University
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2. HOME ADDRESS

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3. EDUCATION

Undergraduate

National Technical University of Athens, Greece, 1960-1965
B.S. in Electrical and Mechanical Engineering (1965)

Graduate

University of Michigan at Ann Arbor, 1965-1970
M.A. in Mathematics, 1966
M.S. in Physics, 1967
Ph.D.: Joint Ph.D. in Physics and Nuclear Engineering 1970

Ph.D. Thesis Topic: "Renormalized Hamiltonian Dynamics in Model Field Theories"

4. PROFESSIONAL APPOINTMENTS

Professor, Division of Applied Mathematics
Brown University, Providence, September 1984 - Present.

Visiting Professor, Departments of Mathematics and Computer Science
Universidade Federal do Ceará, Brazil, June, July, August 2012.

Visiting Professor, Department of Mathematics
Stanford University, Stanford, CA, September - December 1997

Associate Professor, Department of Mathematics
Rutgers University, New Brunswick, September 1981 - August 1984

Member, School of Mathematics, The Institute for Advanced Study, Princeton,
September 1979 - August 1981

Investigator, Department of Mathematics
The Rockefeller University, New York City, September 1976 - August 1979

Assistant Professor, Mathematical Physics,
Universität Bielefeld, Bielefeld, West Germany, August 1975 - August 1976

Assistant Professor, Department of Mathematics
University of Washington, Seattle, September 1972 - July 1975
Research Associate, Department of Physics,
University of Michigan, Ann Arbor, July 1970 - August 1972
(Lecturer, Department of Mathematics,
University of Michigan, An Arbor, July and August 1971).

5. PUBLICATIONS

a. Refereed Publications

“Renormalized Hamiltonian Dynamics in Model Field Theories,” Thesis, University of Michigan, Ann Arbor, (1970)

“Renormalization of the One-space Dimensional Yukawa Model by Unitary Transformation,” (with P. Federbush), *Ann. of Phys.* 68, (1971) 98-101.

“Quadratic Fermi Interaction Hamiltonian,” *J. Math. Phys.*, 12, (1971) 1414-1419.

“Properties of the ϕ_2^4 Interaction Hamiltonian”,: *Jour. of Math. Physics* 15, (1974) 861-866.

“On the Self-Adjointness of the Lorentz Generator for $(\phi^4)_{1+1}$,” *Jour. of Math. Physics* 15, (1974) 867-869.

“Renormalization, Hamiltonian, Pressure and All that, for the Generalized Yukawa Interaction in Two-Space Dimensions,” *Proceedings on Quantum Dynamics (1976)*, 1-27. Zentrum fur inderdisziplinare Forschung, Universitat Bielefeld, Bielefeld, West Germany.

“Soliton Mass and Surface Tension in the $(\lambda|\phi^4|)_2$ Quantum Field Theory,” (with J. Bellisard and J. Froehlich), *Physical Review Letters* 38, (1977) 619-622.

“Soliton Mass and Surface Tension in the $(\lambda|\phi^4|)_2$ Quantum Field Theory,” (with J. Bellisard and J. Froehlich), *Commun. Mathem. Phys.* 60, (1978) 37-72.

“The Glimm-Jaffe-Spencer Expansion for Classical Boundary Conditions and Coexistence of Phases in the $\lambda\phi_2^4$ Euclidean (Quantum) Field Theory,” *Annals of Physics* 118, (1979) 18-83.

“Deformations and Spectral Properties of Merons,” *Jour. Math. Physics* 20, (1979) 2097-2109.

“Symmetry and Related Properties via the Maximum Principle,” (with W. M. Ni and L. Nirenberg), *Comm. Math. Physics* 68, (1979) 209-243.

“Euclidean Yang-Mills and Related Equations”, in *Bifurcation Phenomena in Mathematical Physics and Related Topics*, D. Reidel Publ. Co. (1980) pp.243-267, eds: C. Bardos and D. Bessis.

“Symmetry Properties and Isolated Singularities of Positive Solutions of it Nonlinear Elliptic Equations,” in *Nonlinear Partial Differential Equations and Applied Science*, Marcel Dekker, Inc. (1980) 225-273, eds: R. Sternberg, A. Kalinowski, and J. Papadakis.

“Symmetry Properties of Positive Solutions of Nonlinear Elliptic Equations”, (with W.M. Ni and L. Nirenberg), *Mathematical Analysis, Adv. in Math., Suppl. Studies* 7A (1981) 364-402.

“Global and Local Behavior of Positive Solutions of Nonlinear Elliptic Equations,” (with J. Spruck), *Comm. in Pure and Applied Math*, 34 (1981) 525-598.

- “A Priori Bounds for Positive Solutions of Nonlinear Elliptic Equations” (with J. Spruck), *Comm. in Partial Differential Equations* 6, (1981) 883-902.
- “Symmetry and Isolated Singularities of Conformally Flat Metrics, and of Solutions of the Yang-Mills Equations,” *Annals of Mathematical Studies* 102, (1982) 423-441.
- “On Multimeron Solutions of the Yang-Mills Equations”, (with L. Caffarelli and J. Spruck), *Comm. Math. Phys.* 87, (1983) 485-495.
- “Non-Stationary Markov Chains and Convergence of the Annealing Algorithm,” *Jour. Statistical Physics* 39, (1985) 73-131.
- “The Langevin Equation as a Global Minimization Algorithm”, in *Disordered Systems and Biological Organization*, Springer-Verlag (1985) p.p. 321-326 eds: Bienenstock, F. Folgeman, and G. Weisbuch.
- “Global Minimization via the Langevin Equation,” *Proceedings of 24th Conference on Decision and Control*, Ft. Lauderdale, Florida, December 1985, pp. 774-778.
- “Consistency of Maximum Likelihood and Pseudo-Likelihood Estimators for Gibbs Distributions”, in *Stochastic Differential Systems, Stochastic Control Theory, and Applications*, IMA Vol. 10, Springer-Verlag (1986), 129-145, eds.: W. Fleming and P.L. Lions.
- “Simulations and Global Optimization,” in *Random Media*, IMA Volumes in Mathematics and Its Applications Vol. 7 (1987) pp. 129-145, ed: G. Papanicolaou.
- “A Hierarchical Multiscale Processing of Images”, *Transactions of the Fourth Army Conference on Applied Mathematics and Computing* (1987) 215-225.
- “A Multilevel-Multiresolution Technique for Computer Vision via Renormalization Group Ideas”, *Proceedings on Optoelectronics and Laser Applications in Science and Engineering*, SPIE, January 1988, 214-218, ed: D. P. Casusent.
- “Asymptotic Symmetry and Local Behavior of Semilinear Elliptic Equations with Critical Sobolev Growth,” (with L. Caffarelli and J. Spruck), *Comm. Pure and Appl. Math.* Vol. XLII, No. 3 (1989) 271-297.
- “A Renormalization Group Approach to Image Processing Problems”, *IEEE Transactions, PAMI*, Vol. 11, No. 2 (1989) 164-180.
- “A Bayesian Framework for the Estimation of 3-D Shapes in Robot Vision” (with J. Torrea) *High Speed Computing II*, SPIE Vol 1058 (1989) 86-93.
- “A New Method for Estimating Markov Random Fields” (with M. Almeida), *High Performance Computing in Science and Engineering*, *Proceedings TENCON 1989*, pp. 340-341, Bombay, India
- “Asymptotics of Maximum Likelihood Estimators for the Curie-Weiss Model”, (with F. Comets) *Annals of Statistics* 19 (1991) 557-578.
- “Image Analysis and Computer Vision” (with D. Geman), *Spatial Statistics and Image Processing*, National Research Council, National Academy Press (1991) pp. 1-36.
- “Parameter Estimation for Gibbs Distributions from Partially Observed Data”, (with F. Comets), *Annals of Applied Probability* 2 (1992) 142-170.
- “Parameter Estimation for Gibbs Distributions from Fully Observed Data” in *Markov Random Fields: Theory and Applications*, Academic Press (1993), 471-498, eds.: R. Chellappa and A. Jain.

- “A Variational Method for Estimating the Parameters of MRF from Complete or Incomplete Data” (with M. Almeida), *Annals of Applied Probability* 3 (1993), 103–136.
- “Metropolis-type Monte Carlo Simulation Algorithms and Simulated Annealing”, *Topics in Contemporary Probability and Its Applications*, CRC Series Stochastics and Probability, 1995, pp 159–232, ed.: J. Laurie Snell.
- “A Nonlinear Discriminant Analysis and Clustering with Applications to Speech Problems” (with A. Murua), in *Image Models and Their Speech Cousins*, IMA Series Vol. 80, pp. 13–63, Springer-Verlag 1996, eds.: Larry Shepp and Steve Levinson.
- “Motion Detection and Tracking Using Deformable Templates” (with P. Perez), *Proceeding of the 1994 IEEE International Conference on Image Processing*, Austin, Texas, Vol. II, pp272-276.
- “Classification and Clustering of Stop Consonants via Nonparametric Transformations and Wavelets” (with A. Murua), *Proceeding of the 1995 IEEE International Conference on Acoustics, Speech, and Signal Processing*, Detroit, Michigan Vol. IV, pp. 872–875.
- “Discussion of Analysis and Reconstruction of Medical Images Using Prior Information, by V. Johnson et. al.”, *Case Studies in Bayesian Statistics*, Lecture Notes in Statistics Vol. 105, pp. 219–224, Springer-Verlag 1995.
- “Optimal Transformations for Prediction in Continuous – Time Stochastic Processes” (with A. Murua), *Stochastic Processes and Related Topics*, Birkhäuser 1998, pp. 167-183, eds: I. Karatzas, B.S. Rajput, and M.S. Taqqu.
- “Estimation of Nonparametric Linear Functionals of Continuous–Time Processes from a Finite Data Set: Optimal Transformations for Prediction” (with A. Murua), to appear in *The Annals of Statistics*.
- “Object Recognition via Hierarchical and Syntactic Models” (with A. Zelic), *Proceedings of the 13th International Conference in Digital Signal Processing*, Santorini, Greece, 1997, pp. 1117–1121.
- ”Stochastic Models for Generic Images” (with D. Mumford), *Quarterly of Applied Mathematics*, Vol. LIX, Number 1, 2001, pp. 85-111.
- ”Tracking of Moving Objects in Cluttered Enviroments via Monte Carlo Filter” (with M. Almeida and C. Robertson), *Proceedings, International Conference on Pattern Recognition (ICPR2000)*, Barcelona, Spain, 2000, pp. 175-179
- ”Model-Based Simultaneous Tracking and Recognition of Moving Objects” (with M. Almeida), *Proceedings of International Conference on Artificial Intelligence/Computer Vision*, Rio de Janeiro, Brazil, November 2000, pp. 892-897.
- ”tRNA Secondary Structure via Stochastic Context-Free-Grammrs”, *Proceedings International Conference on Mathematical Analysis and Its Applications*.
- ”Simultaneous Tracking and Recognition via Hierarchical Syntactic Models” (with F. Gomes) *Proceedings of Symposium on Computer Graphics and Image Processing*, pp.225-229 October 7-11, 2002, Fortaleza, Brazil.
- ”Model-Based Tracking of Moving Objects in Cluttered Environments” (with F. Gomes and C. Robertson), *Quarterly of Applied Mathematics* VolLX, No 4 (2002), pp.737-771.
- “Construction of Optimal Transformations for Prediction in Continuous–Time Stochastic Process: Finite Past and Present ” (with A. Murua), *Probability Theory and Related Fields* Vol. 131, No.4, 2005, pp. 479-492.

"Fixed Point Approximations to Gibbs Distributions: Existence and Applications to Stereo Vision", (with Pedro Felzenszwald and Benar Svaiter), to be submitted to Journal of Statistical Physics

"Range Shrinking for Mumford-Shah type Models" (with Pedro Felzenszwald and Benar Svaiter), to be submitted to journal of Experimental Mathematics

c. Technical Reports

"Unitary Renormalization in Model Field Theories," Randall Lab. of Physics, Report No. HE:72-21 (1972), University of Michigan.

"On Two Soluble Field Theoretic Models," Randall Lab. of Physics, Report No. HE:72-30 (1972), University of Michigan.

"Free Boundary Problems, Degenerate Elliptic Equations, and Applications to Quark Confinement," Report, Rutgers University (1984).

"Zero Crossings and the Heat Equation" (with B. Hummel), Robotics and Vision Lab., Report (1984), Courant Institute, New York University.

"A Lower Bound for the Dynamic Critical Exponent of the One-Dimensional Potts Model," (with S. Adachi, P.O. Weir, and J.M. Kosterlitz), Reports in Pattern Analysis No. 149, Div. of Applied Mathematics, Brown University (1987).

"A Multilevel-Multiresolution Analysis of Stationary Gaussian Processes on \mathbb{Z}^d ," Complex Systems Report No. 34, Division of Applied Mathematics, Brown University (1987).

"A Two-stage EM Algorithm with Applications to Emission Tomography" (with M. Hudson), submitted to IEEE Trans. Med. Imaging (1991).

"A Nonlinear Multi-Grid EM Algorithm for Emission Tomography" (with M. Hudson), submitted to IEEE Trans. Med. Imaging (1991).

"Estimation of Nonparametric Linear Functionals of continuous-Time Processes from a Finite Data Set: Linear Predictors" (with A. Murua), *preprint*2015

6. PROFESSIONAL SERVICE (*selected*)

Department Service

- **2017-2018:** Graduate Student Committee
- **2018:** Departmental Nominations Committee
- **2018:** Committee for promotion to Associate Professor of Caroline Klivans
- **2018:** Committee for selection of Prager Assistant Professor
- **Fall 2018:** Committee for DAM Colloquium

Service to Profession (*selected*)

2018-Spring 2019: Organizer for ICERM Spring 2019 Program "Computer Vision"

2018: Associate Editor, International Journal of Image Science and Technology, 1994 - present

7. HONORS AND SOCIETY MEMBERSHIPS – *selected*

Honor:

Elected Fellow of the Institute of Mathematical Statistics

National Research Council, Advisory Panel Member for “Spatial Statistics and Image Processing”, Board on Mathematical Sciences

Society Memberships:

American Mathematical Society

American Statistical Society

Institute of Mathematical Statistics

8. TEACHING, 2018

Spring 2018: APMA 2680 – Mathematical Statistics II

Fall 2018: APMA 2670 – Mathematical Statistics I

9. DATE OF PREPARATION

January 2018