

Condensed Vitae

1. Personal Data

Name: Maurício Vieira Kritz

Birth Date: 19/12/1950

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2. Academic Background

Post-doc, Applied Math. Dept, University of Augsburg, Jan 1990 – Feb 1991

D.Sc. IME/UFRJ, RJ - Jul 1980. Area: computational mathematics.

M.Sc. IMPA/CNPq, RJ - Jan 1975. Area: probability and statistics

B.Sc. PUC/RJ, Jul 1972. Mayors: math. physics and computer science

3. Professional Background

3.1 Experience

- Computational modeling in physics, biology, ecology and economy.
- Biological mathematics: hypergraphs, whole-part graphs, biological organization, biological information, biological interactions.
- Fluid and continuous mechanics; PDEs and variational inequalities; numerical methods and analysis; non-linear equations; fixed point methods, simplicial and continuation fixed point algorithms.
- Scientific programming; programming languages and programming methodology; models of parallel and distributed programs and programming theory.

3.2 Present Interests and Research

- Biological organization and information.
- Foundations of biology, biological mathematics, biological interactions and systems.
- Floodable ecosystems in the Amazons, environmental science.
- Autonomous intelligent observation, adaptive modeling, computational modeling.
- Virtual essays; computational surrogates of natural systems; experimentation on computational would-be worlds.

4. Positions Held

4.1 Present

- Associate researcher, LNCC/CNPq: since Oct. 1982.
- Journal of Universal Computer Science Editorial Board, since 1998.
- Investigator, GEOMA Network, Floodable Ecosystems group, since 2002.
- Committee on Ethics in Scientific Research, since 2004.
- GEOMA Network Scientific Committee, since 2008.
- Director's Council, Brazilian Association of Scientific Editors (ABEC), 2008-2012

4.2 Past (sample, pastward)

- Visiting Professor, Department of Mathematics, University of Strathclyde, UK, September 2010
- Visiting Professor, Department of Mathematics, University of Strathclyde, UK, May–Aug 2009
- Visiting Professor, Faculty of Life Sciences, U. of Manchester, UK, June 2008
- LNCC/CNPq Board for Networking Facilities, Apr 1997–Jan 1999.
- Chairperson: Organizing Committee of the Colloquia on High Performance Scientific Computing, LNCC/CNPq, 1994--1999.
- Visiting researcher: Zoology Museum & Advanced Studies Inst., USP, S.Paulo, Brazil; Oct 1991; July 1989
- CAPES post-doc fellowship: Applied Math. Dept., University of Augsburg, Jan 1990-Feb 1991
- Visiting professor: Math. Dept., UFRGS, Sept-Oct 1986 & Jan 1988

(courses on computational modelling and numerical analysis)

- Visiting researcher: GMD-Bonn and Applied Math. Dept., University of Augsburg, Germany, Nov-Dec 1985; Jun-Jul 1987 & Jul 1988.
- Visiting Professor: Museu Paraense Emilio Goeldi/CNPq, Jun 1986.
- Head of Project: Mathematical Modelling of Amazon Lake Ecosystems. LNCC/CNPq-INPA/CNPq-Eletronorte; Oct 1982 - Aug 1984
- Systems Analyst: IBGE Foundation (Brazilian Bureau of Censuses), Mar 1973-Jan 1980
- Assistant Professor: Math. Dept., PUC/RJ, Ago 1972-Mar 1973
- Research Assistant: National Observatory, Jan 1971-Mar 1973

5. Scientific Meetings (sample, pastward)

- Workshop on Computational Modeling of Knowledge Diffusion, Itacaré, Brasil, Dec 1st – 4th, 2010. Talk: “Knowledge, Anticipation and Circular Enchainment”.
- European Conference on Mathematical TB 2008, Edinburg, UK, Jun 29th – Jul 4th, 2008. Oral Communication: “Organizing Biological Observations: a Model and some Properties”.
- META 2007, Kourou, France, Oct 29th–31st, 2007. Plenary Talk: “Mathematical Modeling of Tropical and Amazon Ecosystems”.
- Workshop on Modeling and Sensing Environmental Systems. LNCC/MCT, Petrópolis, Brazil, Jul 10th–14th, 2006 and Aug 15th–19th, 2008. Member of the Organizing Committee.
- BIOMAT 2005, LNCC/MCT, Petrópolis, Brazil, Dec 3–8, 2005. Chairperson of the Local Organizing Committee.
- C3AD'98 - Colloquia on High Performance Scientific Computing, LNCC/ CNPq, Petrópolis, Brazil, 17-22 Aug 1998. Organizing committee (chairman). Lecture: "Distributed Modelling"
- Brazilian National Congress on Computational and Applied Mathematics, Gramado, Sept 7-12 1997. Organizer of the Mini-symposium "Bio-mathematics: Alternative Approaches"
- C3AD'96 - Colloquia on High Performance Scientific Computing, LNCC/ CNPq, Rio de Janeiro, Brazil, 8-12 Jul 1996. Organizing committee (chairman).
- EMCSR'96-13th European Meeting on Cybernetics and Systems Research, Apr 9-12 1996, Vienna, Austria. Oral Communication: "Creating

Bio-mathematical Worlds"

- C3AD'95 - Colloquia on High Performance Scientific Computing, LNCC/ CNPq, Rio de Janeiro, Brazil, 31 Jul - 4 Aug 1995. Organizing committee (chairman). Communication: "Hyper-documents as wp-graphs"
- C3AD'94 - Colloquia on High Performance Scientific Computing, LNCC/ CNPq, Rio de Janeiro, Brazil, 24-27 Aug and 24-28 Oct 1994. Organizing committee (chairman).
- XVI Brazilian Zoology Congress, João Pessoa, Brazil, 23-27 Jan 1989. Mini-course: "Symbolic Models in the Biological Sciences"
- XIV Brazilian Zoology Congress, Juiz de Fora, Brazil, 2-6 Feb 1987. Mini-course: "Mathematical and Computational Models in Biology and Ecology"
- 2nd Autumn Course on Mathematical Ecology, ICTP, Trieste, Italy, Nov 10 - Dec 12 1986. Communication: "Modeling Amazon Ecosystems"

6. Invited Talks

- "Sensing and Modeling Flooded Amazon Landscapes" and "Gentle Observation of Vital Signals", University of Graz, June 2009
- "Whole-part Graphs and Biological Information", Dept of Mathematics, Purdue University, West Lafayette, IN, US, May 1993.
- "New Ways of Science", Center for Computational Sciences, University of Kentucky, March 2002 (<http://www.ccs.uky.edu/~mkritz/NWS>)
- "Structured Spaces and Computational Biology", Dept of Mathematics, Purdue University, West Lafayette, IN, US, March 2002 (<http://www.ccs.uky.edu/~mkritz/StSp>)

7. Representative Publications

- Kritz, M. V., Trindade dos SANTOS, M. Dynamics, Systems, Dynamical Systems and Interaction Graphs In: Dynamics, Games and Science ed. Berlin : Springer- Verlag, 2011, v.II, p. 509-543.
- Kritz, M. V., Trindade dos Santos, M., Urrutia, S., Schwartz, J.-M. Organising metabolic networks: Cycles in flux distributions. Journal of Theoretical Biology, v.265, p.250 - 260, 2010.
- "Théorie et Modèles I: point de vue général et abstrait", w/ Jean-Yves Béziau, Cadernos UFS Filosofia, Fasc. XIII, vol. 8, Ago–Dec 2010.

- Boundaries, Interactions and Environmental Systems, *Mecânica Computacional*. Buenos Aires: Asociación Argentina de Mecánica Computacional, 2010. v.XXIX. p.2673–2687
- Biological Information and Knowledge, P&D Report, LNCC/MCT, 2009.
- Kritz, M. V., DIAS, Claudia Mazza, SILVA, Jaqueline Maria da, Models and Sustainability in Flooded Amazon Landscapes. São Carlos : SBMAC, 2008, v.1. p.100. (in portuguese)
- Sustainability in Flooded Ecosystems, an Integrated View. In Proceedings of the 2006 International Symposium on Mathematical and Computational Biology BIOMAT 2006, R. Mondaini, editor, BIOMAT Consortium and Editora e-papers, Rio de Janeiro, 2007.
- "Biological Organizations", in Proceedings of the Symposium on Mathematical and Computational Biology – BIOMAT IV, R. Mondaini, ed., e-papers, Rio de Janeiro, 2005.
- "Creating Bio-mathematical Worlds", presented at EMCSR'96. (R&D Report #29/95, LNCC/CNPq, Nov. 1995.)
- "On Relations between wp-graphs and Data Structures". *Logique et Analyse, Nouvelle Série*, v. **39** (153-154): 153-164 (Mars-Juin 1996).
- On Biology and Information, R&D Report #025/91, LNCC/CNPq, Dec 1991.
- "Numerical Modeling of Canopy Viscosity: A Progress Report", in Proceedings of the International Colloquium on Free Boundary Problems: Theory and Applications, 18-20 de Junho de 1987, Irsee, Alemanha Ocidental, Birkhause, 1990.
- "On Ecology and Mathematics", R&D Report #007/89, LNCC/CNPq, May 1989. (in portuguese)
- "On Programming Structures and Mathematics", in P. Chemin, C. di Crescenzo et F. Robert (eds.), *Computers and Computing -- Informatique et Calcul*. J. Willey & Sons/Masson, N.Y., 1986
- "Simplicial Fixed Point Algorithms and Nonlinear Propagation Equations" , Proceedings of the 10th IMACS World Congress on System Simulation and Scientific Computation, 8-12 de Agosto de 1982, Montreal, Canadá.

8. Programming and Systems Analysis (sample)

- Object-oriented programming, Portable Distributed Objects, Individual Based Computational Modeling
- OPENSTEP/Mac OS X programming and system administration
- Computational Models for Amazon Ecosystems: floodable ecosystems.

- Porting MODULEF libraries to the Michigan Terminal System—MTS and maintainance
- Numerical Simulation of Non-linear PDEs
- Co-routines, parallel programming, interactive interfaces
- Double star orbit computation, double star catalog, position with respect to 3 stars
- Programming languages: Fortran, PL/I, Algol (60 & 68), Snobol, C, Objective C, Lisp

9. Teaching Experience (sample)

- Modelling Techniques, LNCC/MCT, 2008, 2010 (36h)
- Biostatistics, Nutrition Course, FASE, 2003-2005 (60h)
- Object-oriented computational modeling, LNCC, 2001 (36h), 2003 (10h).
- Modeling natural systems, LNCC, 2000 (36h).
- Computer science fundamentals, LNCC, 1999 (36h).
- Symbolic Models in the Biological Sciences, Mini-Course (15hs), XVI Brazillian Zoology Congress, João Pessoa, Brazil, 23-27 Jan 1989. (20h)
- Introd. to Numerical Analysis, Math, Dept., UFRGS, Jan.-Feb. 1988. (36h)
- Mathematical and Computational Models in Biology and Ecology, Mini-Course, XIV Brazillian Zoology Congress, Juiz de Fora, Brazil, 2-6 Feb 1987. (15h)
- Building Mathematical Models, Math, Dept., UFRGS, Porto Alegre, RS, Sept.-Oct. 1986. (36h)
- Mathematical Models in Biological Sciences, Mini-Course, Museu Goeldi, Belém, PA, June 1986. (20hs)

9. General Information

9.1 Projects and Synergies

- Agreement for cooperation LNCC–Faculty of Life Sciences, University of Manchester, Brazilian coordinator.
- Member of the Committee for Ethics in Research, Fundação Otacílio Gualberto, Petrópolis.
- GEOMA Network, Flooded Ecosystems Group.

9.1 Foreign languages

English, French, German and Italian (poor)