

## EDWARD L. IONIDES

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### RESEARCH INTERESTS

Inference for partially observed Markov processes; likelihood-based inference; infectious disease dynamics; cell motion; neural spike train analysis; health economics.

### EDUCATION

**1995-2001** Ph.D. in Statistics, University of California, Berkeley.

**1994-1995** Part III Mathematics, Cambridge University. Passed with distinction.

**1991-1994** B.A. (first class) in Mathematics, Cambridge University.

### EMPLOYMENT AND PROFESSIONAL EXPERIENCE

**2002-present** Assistant Professor, Department of Statistics, University of Michigan.

**2001-2002** Visiting Assistant Professor, Department of Statistics, University of Chicago.

### PUBLICATIONS

King, A. A., Ionides, E. L., Pascual, M. and Bouma, M. J. (2008) Inapparent infections and cholera dynamics. *To appear in Nature*.

Ionides, E. L. (2008). Truncated Importance Sampling. *Journal of Computational and Graphical Statistics* **17**, 295–311.

Tapia Granados, J. A. and Ionides, E. L. (2008). The reversal of the relation between economic growth and health progress: Sweden in the 19th and 20th centuries. *Journal of Health Economics* **27**, 544–563.

Ionides, E. L., Bretó, C. and King, A. A. (2007). Modeling Disease Dynamics: Cholera as a Case Study. Chapter 8 of *Statistical Advances in the Biomedical Sciences* (edited by A. Biswas, S. Datta, J. Fine and M. Segal). Wiley, Hoboken NJ.

Ionides, E. L. (2007). Discussion of “Parameter Estimation for Differential Equations: A Generalized Smoothing Approach,” by J. O. Ramsay, G. Hooker, D. Campbell and J. Cao. *Journal of the Royal Statistical Society, Ser. B.* **69**, 783–784.

Ionides, E. L., Bretó, C. and King, A. A. (2006). Inference for nonlinear dynamical systems. *Proceedings of the National Academy of Sciences of the USA* **103**, 18438–18443.

Greene, S. K., Ionides, E. L. and Wilson, M. L. (2006). Patterns of Influenza-Associated Mortality Among U.S. Elderly from 1968 to 1998 differ by geographical region and virus strain. *American Journal of Epidemiology* **163**, 316–326.

Ionides, E. L. (2005). Maximum Smoothed Likelihood Estimation. *Statistica Sinica* **15**, 1003–1014.

Gage, G. J., Ionides, E. L. and Kipke, D. (2005). Information Capacity of Brain Machine Interfaces. *27th Conference of IEEE Engineering in Medicine and Biology Society*, 2110–2113.

Gage, G. J., Ludwig, K., Otto, K., Ionides, E. L. and Kipke, D. (2005). Naïve coadaptive cortical control. *Journal of Neural Engineering* **2**, 52–63.

Ionides, E. L., K. S. Fang, R. R. Isseroff and G. F. Oster (2004). Stochastic models for cell motion and taxis. *Journal of Mathematical Biology* **48**, 23–37.

Fang, K. S., Ionides, E. L., Oster, G., Nuccitelli, R., and Isseroff, R. R. (1999). Epidermal Growth Factor Relocalization and Kinase Activity Are Necessary for Directional Migration of Keratinocytes in DC Electric Fields. *Journal of Cell Science* **112**, 1967–1978.

## MANUSCRIPTS SUBMITTED FOR PUBLICATION

Breto, C., He, D., Ionides, E. L. and King, A. A. (2008). Time series analysis via mechanistic models. *Pre-publication available at <http://arxiv.org/abs/0802.0021>*.

Schweigler, L. M., Desmond, J. S., McCarthy, M., Bukowski, K., Ionides, E. L., and Younger, J. G. (2008). Forecasting Models of Emergency Department Crowding.

Tapia Granados, J. A. and Ionides, E. L. (2008). Health and macroeconomic fluctuations in contemporary Sweden: an analysis and a comparison with the United States.

## GRANTS AND OTHER RESEARCH FUNDING

**2008-2011** Principal investigator (PI) for NSF grant on *Inference for dynamic systems*.

**2008-2010** NIH (Fogarty International Center) cooperative agreement for involvement in the program on *Research and Policy in Infectious Disease Dynamics*.

**2006-2008** Graham Environmental Sustainability Institute grant for *Vector-transmitted diseases in a changing world: a dynamical perspective*. PI, Mercedes Pascual.

**2006-2008** NIH grant for *Cortical control using multiple signal modalities*. PI, Daryl Kipke.

**2004-2008** NSF grant for *Collaborative research: the interplay of extrinsic and intrinsic factors in epidemiological dynamics: cholera as a case study*. PI, Mercedes Pascual.

## EDITORIAL POSITIONS

**2007-present** Associate editor for *Annals of Statistics*.

**2004-present** Editorial board for *International Journal of Statistics and Systems*.

## REFEREE SERVICE

Journal articles refereed for *American Mathematical Monthly*, *Annals of Statistics*, *Ecology*, *Epidemics*, *European Physical Journal B (Condensed Matter and Complex Systems)*, *Journal of Biological Dynamics*, *Journal of Multivariate Analysis*, *Journal of the American Statistical Association*, *Journal of the Royal Society Interface*, *Statistics & Probability Letters*, *Theoretical Population Biology*.

Books and book chapters refereed for *Cambridge University Press*, *Prentice Hall*, *Springer-Verlag*, *Wiley*.

## COURSES TAUGHT

University of Michigan: Introduction to Probability (Math/Stat 425). Analysis of Time Series (Stat 531 / Econ 677). Applied Probability and Stochastic Modeling (Stat 620).

University of Chicago: State Space Models (Stat 333), Linear Models and Experimental Design (Stat 222), Statistical Methods and their Applications (Stat 220).

## PHD STUDENTS

Carles Bretó. Since 2007, Assistant Prof. of Statistics, Universidad Carlos III de Madrid, Spain.

Anindya Bhadra, current.

## PHD STUDENT COMMITTEES

Peter Boldenow (Epidemiology); Luis Fernando Chaves (Ecology & Evolutionary Biology); Ting-Wu Chuang (Epidemiology); Greg Gage (Bio-engineering); Sharon Greene (Epidemiology); Rohit Kulkarni (Statistics); Hirak Parikh (Bio-engineering); Akarin Phaibulpanich (Statistics); Natalya Verbitsky (Statistics).

## PROFESSIONAL MEMBERSHIPS

Institute of Mathematical Statistics.

American Statistical Association.

## OTHER PROFESSIONAL ACTIVITIES

Member of National Center for Ecological Analysis and Synthesis (NCEAS) working group on “Inference for Mechanistic Models.” This involves four meetings at NCEAS (Santa Barbara) during 2007–2009.

Developer of R software package `pomp` for inference from Partially Observed Markov Processes, publicly available at <http://cran.r-project.org>.

Statistics department curriculum committee (2002-2004), graduate curriculum committee (2004-2005), undergraduate curriculum committee (2004-2008), PhD qualifying exam committee (2006-2008).

Summer internship (1997) at Bell Laboratories working with Mark Hansen on spatial modelling of wafer defects in manufacture of integrated circuit silicon chips.

Summer research project (1994) in the University of Cambridge Statistical Laboratory on stochastic networks with Richard Gibbens.

Summer research project (1993) in the University of Cambridge Pharmacology Department Drug Design Group on applications of simulated annealing with Philip Dean.

## AWARDS

**1995** Loeve Fellowship in Probability from University of California, Berkeley.

**1993** Senior Scholarship from Trinity College, Cambridge.

**1992** Junior Scholarship from Trinity College, Cambridge.

## **SEMINARS, PRESENTATIONS AND WORKSHOPS**

**2008** Duke University, Computational Biology & Bioinformatics seminar.

**2008** Workshop on Sequential Monte Carlo at SAMSI, North Carolina; invited discussant.

**2008** Joint Statistical Meetings at Denver; invited session organizer and discussant.

**2008** University of Cambridge Department of Engineering, Signal Processing group seminar.

**2008** University of Cambridge Department of Applied Mathematics and Mathematical Physics, Mathematical Biology group seminar.

**2008** Columbia University, Statistics department seminar.

**2008** Pennsylvania State University, Center for Infectious Disease Dynamics, workshop on epidemic model hierarchies and model validation; invited speaker.

**2007** University of St Andrews, seminar for National Centre for Statistical Ecology,

**2007** Cornell University, Statistics department seminar.

**2007** Wayne State University, Probability and Statistics group seminar.

**2007** Workshop on Statistical Methods for Modeling Dynamic Systems, Montreal; invited speaker.

**2007** University of Cambridge, Statistics group seminar.

**2007** University of Oxford, Statistics department seminar.

**2007** Pennsylvania State University, Statistics department seminar.

**2007** Pennsylvania State University, Center for Infectious Disease Dynamics seminar.

**2007** University of Pittsburgh, Mathematical Biology group seminar.

**2006** University of Michigan, Statistics department seminar.

**2006** SIAM / Society for Mathematical Biology annual meeting, Raleigh, North Carolina; invited minisymposium speaker.

**2006** Northwestern University, Biostatistics department seminar.

**2005** Carnegie Mellon University, Statistics department seminar.

**2005** NSF workshop on Ecology of Infectious Diseases at Washington, D.C.; poster presentation.

**2005** Montreal statistics colloquium speaker (CRM-ISM-GERAD).

**2004** Joint Statistical Meetings at Toronto; contributed presentation.

**2004** IMS/Bernoulli Society meeting at Barcelona; contributed presentation.

**2004** University of Western Ontario, Statistics department seminar.

**2004** NSF workshop on Ecology of Infectious Diseases at Arlington, VA; participant.

**2004** Workshop on Statistical Analysis of Neuronal Data at Pittsburg, PA; participant.

**2003** Workshop on Point Processes - Theory and Applications, Banff International Research Station; invited speaker.

**2002** University of Michigan, Statistics department seminar.

**2002** University of Chicago Graduate School of Business, Econometrics and Statistics seminar.

**2001** University of California, Los Angeles, Statistics department seminar.

**2001** University of Chicago, Statistics department seminar.

**2000** University of California, Berkeley, Statistics department Neyman seminar.