

ALEJANDRO CRUZ-MARCELO, Ph.D.

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OBJECTIVE

Build a career in statistics applying knowledge of Bayesian statistics, finance, proteomics, credit risk management and pharmacokinetics.

EDUCATION

Ph.D Statistics, Rice University, May 2010.

M.A. Statistics, Rice University, 2009.

M.Sc. Probability and Statistics, Center for Mathematical Research, 2006.

B.Sc. Mathematics, National Autonomous University of Mexico, 2008.

B.Sc. Economics (with honors), National Autonomous University of Mexico, 2003.

TECHNICAL SKILLS

- **Expertise in advanced statistical modeling:** Bayesian statistics, MCMC, Monte Carlo simulation, linear regression, ANOVA, time series, multivariate analysis, data mining, extreme value theory, non-parametric techniques, categorical data analysis, regression trees, logistic regression, stochastic processes, stochastic calculus.
- **Extensive experience using statistical software:** R, S-plus, SAS (holder of the “SAS Certified Base Programmer for SAS 9 Credential”), SQL, and Matlab.
- Office software: Word, Excel and Power Point.
- Programming: C (GSL library).
- Operating systems: Microsoft Windows XP/2000/Vista, Mac OS X, Linux.
- Languages: English/Spanish.

FIELDS OF EXPERIENCE

- **Economics and Finance:** Expertise in consumer credit risk management and estimation of the term structure of interest rates. Relevant coursework includes corporate finance, financial engineering, microeconomic theory, macroeconomic theory, and industrial organization. Passed 1st actuarial exam. Familiar with the databases WRSD and TRACE.
- **Medical-related applications:** pre-processing of mass spectrometry data, microarray array data analysis, and pharmacokinetics.

RESEARCH INTERESTS

- Bayesian statistics: parametric and non-parametric.
- Monte carlo methods.
- Hierarchical models
- Term structure estimation and credit risk.
- Pharmacokinetics
- Mass spectrometry data analysis.

WORK EXPERIENCE

Capital One Auto Finance, Plano, Texas, USA.

Sr. Statistician, August 2010 to present

Built risk models using logistic regression and other data mining techniques.

Rice University, Houston, Texas, USA.

Temporary Post Doc Fellow, May 2010 to August 2010

Reviewed and submitted a paper to the Journal of the American Statistical Association (JASA) which was eventually accepted for publication.

RESEARCH EXPERIENCE

Rice University, Houston, Texas, USA.

Research Assistant, Fall 2006 to present

Worked on two research projects. First, developed a new framework for estimating the term structure of corporate bonds. Second, identified features that improve the accuracy of predictions produced by nonparametric Bayesian models. Wrote two manuscripts describing the results. Both documents are currently under revision for publication.

Texas Children's Hospital, Houston, Texas, USA.

Research Assistant, Fall 2007 to Spring 2008

Developed a methodology to measure and compare the performance of algorithms for preprocessing of Mass Spectrometry data; implemented such methodology using real and simulated data; wrote a manuscript reporting the methodology and results. This work led to a publication in the journal Bioinformatics.

MD Anderson Cancer Center, Houston, Texas, USA.

Intern, Spring 2007

Developed a Bayesian pharmacokinetic model to estimate individualized doses for anticancer drugs; wrote C code to implement the corresponding MCMC algorithm.

TEACHING EXPERIENCE

Rice University, Houston, Texas, USA.

Teaching Assistant/Lab Instructor Fall 2006 to Spring 2009

STAT 640: Data Mining (graduate course), Spring 2009

STAT 310: Probability and Statistics, Summer 2008 and Fall 2008

STAT 280: Elementary Applied Statistics, Fall 2006 and Spring 2007

Graded and prepared solutions for homework assignments; lectured in weekly laboratory sessions.

Center for Mathematical Research (CIMAT), Guanajuato, Mexico.

Teaching Assistant, Spring 2006

Statistical Models I (graduate course), Spring 2006

Lectured in weekly sessions; graded and prepared solutions for homework assignments; prepared and presented an introductory course to the statistical package R.

National Autonomous University of Mexico (UNAM), Mexico City, Mexico.

Teaching Assistant Fall 2003 to Spring 2004

Differential Geometry, Spring 2004

Analytic Geometry I, Fall 2003 and Spring 2004

Lectured twice a week; graded and prepared solutions for homework assignments and exams.

AWARDS AND SCHOLARSHIPS

Rice University President's Graduate Fellowship (Fall 2006 – Spring 2010)

Awarded by Rice University for graduate study.

Second Place in the Francisco Aranda National Award (September 2008)

Awarded by the Mexican Statistical Association to outstanding dissertations in the field of Statistics written to obtain a BSc in Mexican universities.

Honorable Mention in the Tlacaclé National Award in Economic Consultancy (November 2004)

Awarded by the association Consultores Internacionales S.C. to outstanding dissertations written to obtain the BSc in Economics in Mexican universities.

PUBLICATIONS

- **Cruz-Marcelo, A.**, Rosner, G., Müller, P., and Stewart, C. (2010), "Modeling Covariates with Non-parametric Bayesian Methods." (submitted to publication)
- **Cruz-Marcelo, A.**, Ensor, K., and Rosner, G. (2011), "Estimating the Term Structure With a Semiparametric Bayesian Hierarchical Model: An Application to Corporate Bonds" accepted for publication in *The Journal of the American Statistical Association* (JASA), DOI: 10.1198/jasa.2011.ap09764
- **Cruz-Marcelo, A.** and Ortega Sánchez, J. (2009) "Interval Estimation in Analyzing Block Maxima Data: A Simulation Study," In: *Proceedings of the XXIII National Forum on Statistics*, Veracruz, México: Mexican Statistical Association. (In spanish)
- **Cruz-Marcelo, A.**, Guerra, R., Vannucci, M., Li, Y., Lau, C., and Man, T.K. (2008), "Comparison of Algorithms for Pre-processing of SELDI-TOF Mass Spectrometry Data," *Bioinformatics*, 24, pp. 2129-2136.

CONFERENCE AND POSTER PRESENTATIONS

- Joint Research Conference on Statistics in Quality, Industry, and Technology 2010, Gaithersburg, MD, USA. Topic contributed talk: "Estimating the Term Structure With a Semiparametric Bayesian Population Model."
- Bayesian Inference in Econometrics and Statistics 2010, Austin, TX, USA. Topic contributed talk: "Estimating the Term Structure With a Semiparametric Bayesian Population Model."
- Bayesian Biostatistics Conference 2009, Houston, TX, USA. Poster presentation: "Designing Dose Individualization for Transplant Anti-Cancer Therapy Based on Bayesian Population Pharmacokinetics Model."
- National Conference of SACNAS 2008, Salt Lake City, UT, USA. Poster presentation: "Comparison of Algorithms for Pre-processing of SELDI-TOF Mass Spectrometry Data."
- XXIII Foro Nacional de Estadística 2008, Boca del Río, Veracruz, México. Topic contributed talk: "Interval Estimation in Analyzing Block Maxima Data: A simulation Study."