Alvaro Moraes

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OBJECTIVE

Seeking a position as a **Scientific Researcher in Applied Math and Computational Science** in a knowledge-based company.

PROFILE

- Researcher in mathematical modeling, simulation and statistical inference.
- Focused on numerical analysis, uncertainty quantification and risk assessment.
- Developed novel multilevel Monte Carlo and multiscale statistical inference techniques for stochastic processes in continuous time. Applications in biochemical kinetics and complex reaction networks in general.
- Experienced programmer in Matlab and the statistical language R among other scientific computer languages.
- Outstanding skills in communicating and promoting novel techniques to general and specific audiences.
- Discipline, leadership and natural ability to interact inside teams are qualities that helped me to reach long term objectives.
- Strongly adapted to multicultural environments where tolerance and respect to the local culture are highly regarded.

EDUCATION

King Abdullah University of Science and Technology (KAUST)
Ph.D. *Of Science in Applied Mathematics*, January 2015. **GPA 3.96 / 4.0**
Thesis Topic: Simulation and Statistical Inference of Stochastic Reaction Networks.

University of the Republic, Uruguay
B.Sc. *in Statistics with a mayor in Actuarial Math*, November 2008. **GPA 3.50 / 4.0**
Thesis Topic: Focused on nonlinear Bayesian regression applied to Item Response Theory.

PROFESSIONAL EXPERIENCE

KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY (KAUST), THUWAL, SAUDI ARABIA.
Postdoc Fellow in Applied Math and Computational Science.
January 2015 to present

- Research and development of numerical algorithms for simulation, numerical analysis and inverse problems related to stochastic modeling of engineering problems.
- Supervision of Ph.D. and M.Sc. students in Applied Mathematics and Computational Science.

ARIZONA STATE UNIVERSITY (ASU), TEMPE, UNITED STATES.
Invited Faculty at the Mathematical and Theoretical Biology Institute.
June 2014 to August 2014

- Teaching state of the art techniques of simulation and inference for stochastic reaction networks. Showing applications in modeling the spread of epidemic diseases in homogeneously mixed populations.
- Designing high quality teaching material including presentation slides, exercises and computer labs.

KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY (KAUST), THUWAL, SAUDI ARABIA.
Researcher in Applied Math and Computational Science.
August 2009 to present

- Developing new methods that can dramatically reduce (10 times or faster) the computational cost of simulation in chemical kinetics allowing rigorous accuracy control.
- Developing a novel multiscale inference methodology with applications in hydrocracking of heavy hydrocarbons. It allows fast model selection and accurate estimation of reaction rates.
- Contributing to the development of a Matlab toolbox that allows approximating any observable quantity of interest arising in complex reaction networks. It is amenable for parallel computing and can handle any user-defined set of chemical species and reaction rates.

KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY (KAUST), THUWAL, SAUDI ARABIA.
Teaching Assistant.
August 2009 to present

- Assistant at the following courses: uncertainty quantification, numerical methods for stochastic differential equations, stochastic methods in engineering and numerical linear algebra.
- Passion and enthusiasm for teaching as well as rigor and precision are recognized in the anonymous reported surveys, I obtained very positive feedback from the students.

OAK RIDGE NATIONAL LAB, TN, UNITED STATES

Research Intern.

June to August 2009 and 2010

- Implementation in the supercomputers Kraken and Road Runner II.
- Formulated mathematical problems related to stopped diffusions and their approximation.
- Implemented a computational hierarchy of models applied to chemical reaction kinetic equations.
- Accurate error estimation and testing strategies for passing between different models.
- Documented the developed codes, benchmarking and conclusions.

ROYAL INSTITUTE OF TECHNOLOGY, STOCKHOLM, SWEDEN

Mathematical and Statistical Consultant.

February 2009 to June 2009

- Implementation of numerical methods for multiscale simulation of the evolution of epidemics in uniform populations.
- Participated in seminars on Computational Fluid Mechanics and Mathematical Methods in Micro to Macro Scales.
- Modeling weak approximation of diffusions with jumps with applications in finance.
- Analysis of stability and long term behavior of biological systems.

FACULTY OF ENGINEERING, UNIVERSITY OF THE REPUBLIC, MATH DIVISION, MONTEVIDEO, URUGUAY

Lecturer and Researcher at the Probability and Statistics Lab.

May 2004 to December 2008

- Participated in projects related to epidemiology and public health by analyzing statistical data.
- Results allowed designing new and effective policies for prevention.
- Statistical analysis of background knowled of new engineering students: design of tests, data processing, statistical analysis and elaboration of new policies and programs
- Increase the technical level of many peers of the laboratory by providing effective training in novel statistical tools with applications in forecasting the evolution of epidemiological diseases.
- Taught undergraduate and degree-level courses of math and statistics for undergraduate students.

FREELANCE. PRIVATE TUTORING SCHOOL, MONTEVIDEO, URUGUAY

Professor of Mathematics and Statistics.

March 2000 to December 2008

- Director of a private tutoring academy registered in the Ministry of Culture of Uruguay.
- Yearly, from March till December, more than 120 students attended my lectures and more than 90% approved their exams.
- Excellence in teaching mathematical analysis, linear algebra, financial mathematics, probability models and inferential statistics.

COMPUTER SKILLS

- **Statistical Software:** SPSS, SAS, Minitab.
- **Mathematical Software:** COMSOL, Mathematica, Latex.
- **Programming:** MATLAB, Octave, R, Python.
- **Operating Systems:** Microsoft Windows family, Apple OS X, and Linux.

AWARDS AND RECOGNITIONS

- Academic Excellence Award (KAUST, 2013).
- Provost's Award for Outstanding Scholastic Scholarship (KAUST, 2010).
- Graduate Fellowship Award (KAUST, 2009).
- Member of the Uruguayan Team for the Iberoamerican Mathematical Olympiad (Ministry of Education and Culture, Uruguay, 1991).

MEMBERSHIPS

- SIAM, SUME.
- KAUST SRI Uncertainty Quantification Centre, http://sri-uq.kaust.edu.sa/Pages/Moraes.aspx
- KAUST Stochastic-Numerics Group, http://stochastic_numerics.kaust.edu.sa/Pages/Moraes.aspx
- Laboratory of Probability and Statistics, http://www.lpe.edu.uy/secciones/integrantes.php

LANGUAGES

- Spanish: Native language.
- English: Full professional proficiency.