
Civil Engineering/Soil Mechanics

Expertise Numerical Simulation & Modeling, PDEs, Data Reconstruction & Visualization, Inverse Problem, Financial Modeling, Optimization

Education M.B.A. (Finance), 2002
University of New York (E.S.C.E.M)/ Prague
Ph. D., Physics, 1996
University of Waterloo, Canada
M. Sc., Physics, 1990
B. Sc., Physics, 1988
University of Chile, FCFM, Chile

Honors 1997-99 Industrial Research Fellowship, NSERC, Canada
W. B. Pearson Medal in Physics for Creative Research in Ph.D. Thesis, 1997
1995-96 Ontario Graduate Scholarship, Canada
Honorable Mention, 1996 Gravity Research Foundation Essay Contest, USA, for the paper "Testing the Equivalence Principle in the Quantum Regime" (with R. B. Mann)

Professional Experience

2006 - Present *Itasca S.A., Santiago de Chile, Project Engineer*
2005 - 2006 *Hewitt Associates, Prague, Czech Republic, Project Director*
2004-2005 *Radiant Systems, Prague, Czech Republic, Project Manager*
2003 *University of Chile, Math Modeling Center, Visiting Researcher*
1997 - 2003 *PetRosEikon Inc., Milton, Canada, Research Associate*
2002 *Meridian Consulting, Prague, Czech Republic*
External Financial Modeling Consultant

Project Experience

Numerical Modeling: Worked on numerical aspects related to inverse problems in fluids. Developed numerical algorithms to recover information about objects immersed in a region filled by a Stokes fluid. Performed R&D with non-seismic data processing and interpretation tools. Developed simulation algorithms for the electromagnetic response of a buried object in a layered medium. Developed and modified computational geometry libraries able to manipulate 3D objects. Developed integration algorithms over general polyhedral anomalies, generated advanced technique to mesh and decimate complex models from CAD tools such as GEMCOM, and modeled data by using linear and nonlinear methods (Inverse Problem). Developed 1D inversion algorithms for resistivity, airborne EM & MT surveys using Occam and Marquardt optimization/regularization techniques. Developed 2D inversion algorithms for ray tracing tomography; and developed 3D Inversion algorithms for IP/Resistivity and DC Magnetic surveys using Conjugate Gradient and Quasi-Newton optimization methods. Applied complex 3D interpolation

techniques (Natural Neighbor) to develop imagining software for geological data surveys. Developed spectral algorithms (frequency domain) for missing data problems (not enough information in time domain).

Financial Modeling: Developed and implemented advanced methods to the modeling of world financial markets (market timing). Created forecasting algorithm for the combination (spreads) of composite financial indexes (S&P500, NASDAQ, etc.) — Algorithm is based on original strategy that looks for short-term market inefficiencies and has no equivalent on the commercial market — and outperformed time series prediction from standard statistical software (STATISTICA). Developed valuation models for hedging and option pricing (Black-Scholes models). Implemented complex models for pricing of interest rate derivatives and discrete models such as binomial trees for pricing exotic options.