Brett van de Sande

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Date of birth: November 2, 1965
Place of birth: New Jersey
Citizenship: USA

Objective

Since 2005, I have working in the field of Education Research. My work has spanned a wide range of topics: artificial intelligence, natural language parsing, intelligent tutor systems, models of learning, models of instruction, and strategies for help-giving. For this work, I have set up ETL processes and analyses for data streams and large databases. I have developed various models of student activity and learning. I have developed a wide range of associated statistical analyses for analyzing product use and student behavior.

With my background as a researcher in theoretical physics, I bring with me strong mathematics, modelling, and problem-solving skills. With my experience in education research, I bring with me experience in models of human behavior, artificial intelligence, machine learning, and working with large sets of data.

Education

The Ohio State University, Ph.D. (Physics), 1994.

California Institute of Technology, B. S. (Physics), 1988.

Relevant Skills

Modelling:
Clustering (Gaussian models), Support Vector Machines, a wide variety of linear and logistic regression models, finite-element models, time series models & Fourier analysis. General graph models, tree-like models (random forest). Classical rule-based AI.

Solution techniques:
Solution of linear systems and eigenvalue problems, solution of constrained systems, sparse and dense matrix techniques, Monte-Carlo techniques. Perturbative methods. Function minimization, root-finding, search alogorithms.

Statistics:
Error estimation, maximum likelihood and least squares, model comparison (AIC and BIC), wide variety of statistical tests.

Programming languages:
Mastery: python, SQL, lisp, c, FORTRAN, Mathematica, Javascript.
Extensive use: PHP, Perl, c++, bash & csh.

Database and data technologies:
Relational databases, Google Analytics, Google Tag Manager. Implementation and analysis of multi-condition experiments.

Full stack developer:
Linux/MacOS, SQL, Python/PHP, Javascript/jQuery/Dojo/HTML/CSS. Data-driven QA strategies, high availability servers.

Professional Experience

Reperio.ai (startup led by Jeffrey Davitz), San Francisco CA
2019 Consulting on Education Technology.

Pearson Edcation, Centennial CO
2014-2018 Research/Data Scientist

Arizona State University, Tempe AZ
2008-2014 Research Professional, Physics Education

University of Pittsburgh, Pittsburgh PA
2005–2008 Research Associate, Physics Education

Geneva College, Beaver Falls PA
1999–2004 Assistant Professor, Physics and Mathematics.

Universität Erlangen-Nürnberg, Erlangen, Germany
1996–1999 Post-doctoral Associate, Light-front field theory.

Max Planck Institut für Kernphysik, Heidelberg, Germany
1994–1996 Post-doctoral Associate, Light-front field theory.

Ohio State University, Department of Physics
1989–1990 Experimental particle physics.
1991–1994 Graduate Research Assistant, Light-front field theory.

University of Pennsylvania, Department of Physics
1988–1989 Room temperature liquid calorimetry for use at the SSC.

Oak Ridge National Lab, Health and Safety Research Division
1988 Laser Optics and Scanning Tunneling Microscopy.

U. S. Army Electronics Technology and Devices Lab, Ft. Monmouth N. J.
1983–1984 Microwave vacuum tube design and testing.
1985–1987 Theoretical studies of quantum transport in semiconductors.