Brett van de Sande

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Date of birth: November 2, 1965
Citizenship: USA

Summary

Since 2005, my work has focused on Educational Technology and Education Research. This work has revolved around three main themes: Intelligent Tutor Sytems (ITS), log data analysis, and conducting experiments. My first line of interest has been the development of Intelligent Tutor Systems (ITS) for teaching introductory physics, teaching system dynamics, and for pre-algebra/algebra.

For log analysis, I have developed logging pipelines for capturing fine-grained student activity when using interactive course content. I have developed new log analysis metrics for evaluating student behavior and learning. Finally, I have developed models of student learning which are currently being used in commercial products.

My third area of interest is in using educational technology to run experiments. I have developed tools and processes for conducting well-controlled, multi-condition studies in an authentic setting (graded homework assignment). The ability to run such studies is essential for developing advanced educational technology, as well as for understanding how we learn.

Education

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

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

Relevant Skills

Databases and data-mining: relational databases, conducting research in user modeling and developing new data-mining techniques.

Artificial Intelligence (AI): Machine learning techniques, as well as classical, rule-based AI.

Programming languages:
mastery: lisp, c, FORTRAN, Mathematica, python, SQL, javascript
extensive use: php, Perl, bash & csh, c++

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

Teaching Experience

Geneva College (1999–2004) Introductory Physics, Classical Mechanics, Quantum Mechanics, Numerical Methods, Linear Algebra, Abstract Algebra, Differential Equations, Remedial Algebra, and Calculus. Introductory Physics lab instructor.

Universität Erlangen-Nürnberg (1996–1999) Recitation instructor for statistical mechanics, introductory mechanics, quantum mechanics, electricity & magnetism.

Ohio State University, Department of Physics (1989–1992) Recitation instructor for introductory physics and grader for graduate courses.

Professional Experience

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

Pearson Edcation, Centennial CO
2014-2018 Research Professional, Physics Education

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.