

# Alejandro Pauly

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## EDUCATION

**PhD, Computer Engineering.** May, 2007

University of Florida, *Gainesville, FL*

Dissertation Title: Vague Spatial Algebra (VASA) — Design, Implementation, and Database Integration of a Data Model for Vague Spatial Data as a Foundation of the Next Generation of Spatial Databases and Geographical Information Systems.

**MS, Computer Science.** August, 2003

University of Florida, *Gainesville, FL*

**BS, Information Systems Engineering.** January, 2000

Universidad Latina de Costa Rica, *San Jose, Costa Rica*

## EXPERIENCE

**Applications Programmer** – Sage Software, Healthcare. Alachua, FL, (May 2007 - Present)

- Assigned as development lead for the new imaging application. This application is part of the company's medical practice management and medical records software suite. The imaging application handles the storage, retrieval, and visualization of document and diagnostic images used in clerical and clinical settings.

**Research Assistant** – University of Florida (January 2004 – May 2007)

- Conducted research, developed concepts and their corresponding implementations as part of the Space, Time, and Uncertainty Project funded by the National Science Foundation.

**Teaching Assistant** – University of Florida (May 2000 – December 2003)

- Taught support lectures for Data Structures and Algorithms course attended by about 150 students. Supported students and professor in Software Engineering (200 students), Introduction to Databases (40), and Programming Language Concepts (30) undergraduate courses. Supported students and professor in Database Management Systems (40), and Programming Language Principles (50) graduate courses.

**Systems Analyst** – Prosix, S.A. Costa Rica, (April - December 1999)

- Designed, developed, tested, and deployed parts of the most widely used credit card processing system in Central America.

- Assigned as project lead (team of 4) for the design and development of Customer Service and Case Management System. The system minimizes the response time for technical problems found in the processing of credit card transactions.

- Organized and re-developed parts of Loan Disbursement, Cycle Management, and Collections systems. Traveled abroad to Nicaragua to re-implement parts of the system in order to adapt it to the specific needs of the services provided locally.

**Software Engineer** – Tecnologia y Comercio S.A, Costa Rica, (September 1997 - April 1999)

- Implemented and provided support for the plant maintenance system for the ICE (the only electricity provider in Costa Rica). The system is in charge of scheduling plant maintenance of over 30 geothermic and hydroelectric power plants ensuring that there is enough power being generated to serve the country's need.

- Provided support and upgrades to the public telephone provider assistance system.

**Independent Consultant** – Costa Rica, (January 1997 – December 1999)

- Designed, developed, tested and deployed back office applications for a recognized law firm in Costa Rica. The applications support case management, trademark processing, billing, trials, and related information.

**Programming Instructor** – Universidad Americana (March 1998)

- Hired by contract to teach intensive courses on C++ programming to public high school teachers.

**Undergraduate Teaching Assistant** – Universidad Latina (September 1998)

• Assist professor and conduct supplementary lab sections in Introduction to Programming and Data Structures and Algorithms courses.

## RESEARCH PROJECTS

**Uncertainty Handling in Spatial Databases** (2003-2007).

Formalized and implemented concepts for a Vague Spatial Algebra (VASA) ideal for handling uncertainty in spatial databases.

**Spatial Algebra 2D** (2005-2006).

Developed and implemented data types and algorithms for complex spatial objects in databases. Created software libraries and integrated them into commercial database systems.

**Structured Large Objects** (2006).

Conceptualized and implemented a data storage mechanism that allows complex, highly structured data objects to be stored in generic, unstructured storage mechanisms offered by commercial database systems.

**Rational Number Library** (2004).

Implemented an arbitrary-precision rational number library ideal for scientific database applications.

## TECHNICAL PRESENTATIONS

**Spatial Uncertainty in Databases.** Wesleyan University, Middletown, CT. (March, 2007)

**Overview of VASA: A Vague Spatial Algebra.** University of Florida Database Research Center Seminar, Gainesville, FL. (September, 2006)

**Preserving Local Topological Relationships.** ACM-GIS Conference, Bremen, Germany. (November, 2005)

**Use of Rational Numbers in the Design of Robust Geometric Primitives for Three-Dimensional Spatial Database Systems.** ACM-GIS Conference, Bremen, Germany. (November, 2005)

**Identifying Topological Predicates for Vague Spatial Objects.** ACM-SAC Conference, Santa Fe, NM. (March, 2005)

## PUBLICATIONS

**Vague Spatial Data Types**

A. Pauly, M. Schneider – as a chapter in the Encyclopedia of GIS, Springer (2008)

**Spatial Vagueness and Imprecision in Databases.**

A. Pauly, M. Schneider – ACM Symposium on Applied Computing. (2008)

**Ensuring the Semantic Correctness of Complex Regions.**

M. McKenney, A. Pauly, R. Praing, M. Schneider – ER Conference. (2007)

**Local Topological Relationships for Complex Regions.**

M. McKenney, A. Pauly, R. Praing, M. Schneider – International Symposium on Spatial and Temporal Databases. (2007)

**Querying Vague Spatial Objects in Databases with VASA.**

A. Pauly, M. Schneider – International Symposium on Spatial Data Quality. (2007)

**ROSA: An Algebra for Rough Spatial Objects in Databases.**

A. Pauly, M. Schneider – International Conference on Rough Sets and Knowledge Technology. (2007)

**Preserving Local Topological Relationships**

M. McKenney, A. Pauly, R. Praing, M. Schneider – ACM International Conference on Advances in Geographic Information Systems. (2006)

**Topological Reasoning for Identifying a Complete Set of Topological Predicates between Vague Spatial Objects**

A. Pauly, M. Schneider – Florida Artificial Intelligence Research Society Conference. (2006)

### **Structured Large Objects in Databases**

M. McKenney, A. Pauly, R. Praing, M. Schneider – Technical Report, University of Florida. (2006)

### **Topological Predicates Between Vague Spatial Objects**

A. Pauly, M. Schneider – International Symposium on Spatial and Temporal Databases. (2005)

### **Identifying Topological Predicates for Vague Spatial Objects .**

A. Pauly, M. Schneider – ACM Symposium on Applied Computing. (2005)

### **Dimension-Refined Topological Predicates**

M. McKenney, A. Pauly, R. Praing, M. Schneider – ACM International Conference on Advances in Geographic Information Systems. (2005)

### **Vague Spatial Data Types, Set Operations, and Predicates**

A. Pauly, M. Schneider – East-European Conference on Advances in Databases and Information Systems. (2004)

## **AWARDS AND SERVICE**

Proceedings Chair and Program Committee member for the ACM International Conference on Advances in Geographic Information Systems (2007-2008)

Database Research Center Seminar Coordinator, University of Florida (2006-2007)

CISE Dept. Travel Award to present at the FLAIRS Conference in Melbourne, FL (2006)

ACM Sigapp Travel Grant to present at ACM-SAC in Santa Fe, NM (2005).

CISE Dept. Travel Award to present at the ACM-SAC in Santa Fe, NM (2005).

Awarded out-of-state tuition waiver by the Florida-Costa Rica Linkage Program (2000).

## **RELEVANT COURSEWORK**

XML and Data Management, Concurrent Programming, Bioinformatics, Computer and Network Security, Artificial Intelligence, Spatial and Spatio-Temporal Databases, Distributed Multimedia Systems, Computational Geometry and Applications for GIS and Spatial Databases.

## **SKILLS**

C, C++, Java, C# (.NET), PHP, Perl, Oracle, Sybase, MySQL, Progress 4GL, Visual Studio, Unix/Linux, Windows,, Delphi, Powerbuilder, LaTeX.

## **NOTES**

Legal permanent resident of the US and fully authorized to work.

Bilingual, fluent in spoken and written English and Spanish.

References available upon request.