CURRICULUM VITAE

Dr. David W. Franke

Chief Scientist, Vast.com

Adjunct Associate Professor
Department of Computer Science
The University of Texas at Austin
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Senior Member, AAAI

EDUCATION

1992   Ph.D. Computer Science
The University of Texas at Austin
Dissertation Advisor: Professor Benjamin J. Kuipers
Dissertation: *A Theory of Teleology*

1977   M.S. Computer Science
The Pennsylvania State University
Advisor: Professor Donald B. Johnson

1976   B.S. Mathematics, *Summa Cum Laude*
The University of Oklahoma

WORK HISTORY

Chief Scientist   **Vast.com, Austin TX**

- Data mining and data analysis for market insights, descriptive models, and predictive models for consumer considered purchases (automotive, real estate, travel).
- Lead the data science team.

Member Technical Staff   **Google, Mountain View CA**

- Search Quality, Eval, Research Team
  - Managed engineering team that supported click-based evaluation of search experiments.
  - Research on user tasks and user intent in search queries.

Associate Professor   **St. Edward's University, Austin TX**

- Taught undergraduate Computer Science courses in New College.
- Taught graduate Master of Computer Information Systems (MCIS) courses in the School of Management and Business.

Distinguished Technical Fellow   **Trilogy Software Inc., Austin TX**

- Manage intellectual property: evaluate internally developed technology for patent potential, coordinate interaction with patent attorneys in developing patent disclosures.
- Initial investigation and implementation of text mining for Trilogy's automotive demand intelligence network.

- Optimization modeling (linear programming) and prototype development for price optimization tool.
- Implementation of data mining (association rule mining) for Trilogy's Sales Optimizer tool.
- Product research and development, technical lead.
- Principle architect and implementer on Trilogy's flagship product SalesBUILDER, a product configuration tool.
- Technology evaluation of potential acquisitions.

Senior Member, Technical Staff **Microelectronics and Computer Technology Corporation (MCC), Austin TX**

- Developed research proposal and "selling" materials for Hardware/Software CoDesign project. Pitched the project to potential funding companies, conducted initial project research.
- Managed team that developed a VHDL (VHSIC Hardware Description Language) compiler and simulation environment. The resulting product had greater language coverage and better performance than any commercial tool available at the time.
- Promoted use of GNU tools and supported same in transition from LISP to C/C++ environments.
- Research on design knowledge representation for digital system designers.

Senior Member, Technical Staff **Texas Instruments, Inc., Austin TX**

- Research and development of decision support tools (quantitative decision analysis, expert systems). Principle researcher, team lead, project manager for quantitative decision analysis tool.
- PC software product development - disk storage management, speech recognition products. Team lead, project manager.
- Computer architecture research and design (memory system architecture).
- Operating system design and implementation for a proprietary 16-bit minicomputer. Team lead.

TEACHING

The University of Texas at Austin

David is an Adjunct Associate Professor in the **Computer Sciences Department** at UT.   He also teaches in the **Masters of Business Analytics** program in the **McCombs School of Business** at UT.

Courses

- Computer Science (Undergraduate Computer Science degree program)

    o CS 378 - Big Data Programming

        ▪ The map-reduce programming paradigm is a fundamental tool used in processing large data sets, and is supported in current tools such as Hadoop. Apache Spark offers another programming paradigm for processing large data sets. In this course the student will gain an understanding of the concepts embodied in map-reduce, and will investigate how map-reduce is used to address various problems in processing and analyzing large data sets. This course will explore map-reduce as implemented in Hadoop, as well as the associated distributed file system (HDFS). In this course you will gain an understanding of the concepts offered and supported in Spark, and will investigate how to apply these concepts to address various problems including those you addressed using map-reduce.

- - CS 363D - Introduction to Data Mining

- McCombs School of Business (Master of Business Analytic Program)

    - MIS 381N.1 - Intro to Data Management

        - Fundamental to any analytics initiative is the data stored in database management and other data storage systems. It is often said 70-80% of the time in doing analytics goes towards extracting, cleaning, and transforming data. This class is designed for business analytics students to explore various concepts of data management and develop expertise in data querying and processing. The following are some learning outcomes of this course:

            - Understand different types of data models

            - Develop skills to model organizational data using Entity-Relationship models using modeling tools

            - Analyze functional dependencies and normalization, and design relational databases

            - Gain expertise in data definition and data manipulation using Structured Query Language (SQL)

            - Understand concepts behind building data warehouse and big data systems

            - Gain working knowledge in Big Data storage processing using Hadoop map-reduce and Spark

            - Understand Big Data ecosystems and analytics

St. Edward's University

From June 2005 through August 2007, David was an Assistant Professor at St. Edward's University, with a joint appointment to New College and the School of Management and Business. In New College, he taught courses for the P.A.C.E. Computer Systems Management degree program. In the School of Management and Business, he taught courses for the MS in Computer Information Systems (MCIS) program.

Courses

- New College (Computer Systems Management degree program)

    - COSC 1323 - Computer Science Concepts I: Introduction to Programming

        - This course introduces students to fundamental aspects of the field of computing, focusing on problem-solving and software design concepts and their realizations as computer programs using JAVA. Topics include procedural abstraction, control structures, iteration, recursion, data types and representation, arrays, records, and user-defined types. Introduction to a high-level language, for the purpose of gaining mastery of these principles, will be done in a closely coordinated laboratory experience.

    - COSC 2325 - Computer Science Concepts II: Data Structures

- This course moves students into the domain of software design, introducing principles that are necessary for solving large problems. With an emphasis on the software design process, topics include abstract data types, specifications, complexity analysis and file organization, basic data structures (queues, stacks, trees, linked lists) and transformations (sorting and searching) are introduced as fundamental tools that are used to aid this process. Time and space analysis and verification are also included. Applications of these topics emphasizing software design will be developed in JAVA. Prerequisite: COSC 1323 and COSC 1123

- o MATH 2310 - Mathematics of Business

  - A non-calculus based business mathematics course designed to meet the mathematics requirement for New College business majors. Topics include a review of algebra, the mathematics of finance, application of the exponential function, linear equations and matrices, Leontief input-output models, methods of maximization and minimization with constraints and the simplex method, graph theory, analysis of charts and graphs, and the basic principles or probability. Basic game theory and Markov chains may also be included. Prerequisite: MATH 1314.

- o MATH 2315 - Discrete Mathematics

  - An introduction to topics and problems in mathematics that are commonly used in computer science and information systems analysis, design and operations. These topics include principles of counting, logic, set theory, mathematical induction, relations and functions, and an introduction to computational complexity and to graph theory. Prerequisite: MATH 2312.

- School of Management and Business (Masters of Computer Information Systems degree program)

  - o MCIS 5301, ISMG 5301 - Introduction to Programming

    - This course teaches the basic skills of programming a computer using a high-level language and a visual development environment. It introduces data types, arrays, structures, algorithm design, control structures, loops, procedures, data abstraction, and object-oriented programming. Students are required to develop algorithms and write computer programs.

  - o MCIS 6306, ISMG 6306 - Database Systems

    - This course provides an overview of modern database systems, including the critical issues for success in management of databases, such as designing, modeling, creating, querying, programming and administering a database. Different systems and system architectures also are examined. Prerequisite: at least concurrent with MCIS 5301 and MCIS 5100.

  - o MCIS 6310 - Systems Analysis and Design

    - This course introduces students to a software development process, system analysis, system design, requirements identification and collection, data modeling, design of an interface and data management. Students will develop an understanding of the iterative software development process and develop system requirements and a system design through use of the Unified

Modeling Language (UML) and a visual modeling tool. In addition to object-oriented and iterative methods, structured analysis and design techniques will also be discussed as an alternative. Prerequisites: MCIS 5100, MCIS 5301, and MCIS 6306.

- o MCIS 6313 - Data Warehouse and Data Mining

  - This course covers the fundamentals of data warehousing architecture and the issues involved in planning, designing, building, populating and maintaining a successful data warehouse. The course introduces students to data mining, and how it relates to data warehousing. Specific topics covered include the logical design of a data warehouse, the data staging area and extract-transform-load processing, the use of multi-dimensional analysis using OLAP techniques, and coverage of the knowledge discovery process using data mining techniques for associations, classification, clustering, and regression. Prerequisites: MCIS 6306.

- o MCIS 6314 - Web Programming

  - This course introduces students to concepts, architectures, and programming and scripting languages used to construct Web sites and Web applications. The course explores client-side and server-side scripting and programming techniques and languages used to implement today's Web applications including database-based applications. Prerequisites: MCIS 5301, MCIS 6306, MCIS 6308.

- o MCIS 6315 - Information Systems Capstone

  - This course provides a system-oriented view of the organization and its relation with information technology. It also addresses the information system function within the organization and how disparate technologies and computer platforms and networks can be integrated to provide a flexible and efficient infrastructure for the organization. Students work on a planning, design, implementation or re-engineering project that includes a thorough investigation of an information system and the formulation and evaluation of strategies that determine the character, direction and success of an organization. Ethical issues also are identified and analyzed. This project may be undertaken in collaboration with capstone students from the MBA Program. Prerequisites: Final trimester.

Mu Sool Won

David is 5th Don in Mu Sool Won, and teaches the traditional Korean martial art at the headquarters school in north Austin under the leadership of Grandmaster Byung In Lee.

PAPERS

- **Journals**

  - o "Configuration Research and Commercial Solutions", in *AI EDAM* (special issue on Configuration Design), Vol. 12, No. 4 (Sept. 1998), pp. 295-300.
  - o "Deriving and Using Descriptions of Purpose", in *IEEE Expert* (special track on Functional Reasoning), Vol. 6, No. 2 (April 1991), pp. 41-47.
  - o "Embedding Rule Inferencing in Applications", in *IEEE Expert* (special track on Object-Oriented Programming in AI), Vol. 5, No. 6 (December 1990), pp. 8-14.

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