

Stephen V. Rice, Ph.D.

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Education

- Ph.D. in Computer Science, University of Nevada, Las Vegas (UNLV), 1996
- M.S. in Computer Science, University of Illinois at Urbana-Champaign, 1981
- B.S. in Mathematics, Western Michigan University, 1979

Experience

- Computer scientist, software engineer and architect
- Pattern recognition, machine learning, artificial intelligence
- Efficient algorithms and data structures for processing “big data”
- Database systems, search engines, data mining
- Programming language design, compiler construction
- User interface design
- Audio algorithms and systems
- Simulation and modeling
- Computational biology
- C, C++, Java, Python, R, Javascript, PHP, Windows, Unix/Linux, Android, MSVS, Eclipse, SQL, ODBC, JDBC, ActiveMQ, TCP/IP, etc.

Work History

- Software development: St. Jude Children’s Research Hospital (since 2015), Comparisonics, UNLV, CACI, Oracle (40th employee), IBM
- Computer science professor: University of Mississippi, San Juan College

Innovations

- Custom database system developed at St. Jude for efficient storage and retrieval of hundreds of millions of genetic variants (SNPs and indels)
- FindSounds.com, the leading web search engine for sound effects since 2000 ([link](#))
- *FindSounds Palette*, a start-of-the-art audio database system
- *FindSounds for Android*, the first mobile app for audio web search
- Comparisonics colored waveform display, patented invention for visualizing audio
- “Sound-matching” algorithm for computer perception of sound
- Object-oriented extensions to the Simscript programming language (in collaboration with Nobel laureate Harry M. Markowitz)

- Book on optical character recognition (OCR) depicting sources of error in character recognition; this book influenced the development of CAPTCHAs
- Software toolset ([link](#)) and methodology for measuring the accuracy of OCR systems using sequence-comparison algorithms, and doctoral dissertation on the subject ([pdf](#))
- The UNLV Annual Tests of OCR Accuracy (1992-1996), the first large-scale independent evaluations of commercial OCR systems
- A “voting” OCR system (1991), which combined existing OCR systems by taking a majority vote to improve accuracy, an early example of ensemble learning
- Simgrip and Modsim APIs for portable graphics, animation, and graphical user interfaces (1989), which pre-dated Java and Flash by six years
- The Modsim object-oriented programming language for computer simulation (1988)
- *TED* (1983), the first-known table editor for relational databases
- Oracle’s first SQL pre-compiler (1982)

Selected Publications (see Google Scholar for complete list: [link](#))

- Books:
 - S.V. Rice, G. Nagy, and T.A. Nartker, *Optical Character Recognition: An Illustrated Guide to the Frontier*, Kluwer Academic Publishers, Norwell, MA, 1999 ([link](#))
 - R. Belanger, B. Donovan, K. Morse, S. Rice, and D. Rockower, *Modsim: A Language for Object-Oriented Simulation*, CACI Products Company, La Jolla, CA, 1989
- Patent:
 - S.V. Rice and M.D. Patten, *Waveform Display Utilizing Frequency-Based Coloring and Navigation*, U.S. patent no. 6,184,898, Patent and Trademark Office, Washington, DC, 2001 ([link](#))
- Journal articles:
 - S. Newman, L. Fan, A. Pribnow, A. Silkov, S.V. Rice, et al., “Clinical Genome Sequencing Uncovers Potentially Targetable Truncations and Fusions of *MAP3K8* in Spitzoid and Other Melanomas,” *Nature Medicine*, 25(4), 2019 ([link](#))
 - S.V. Rice, H. Bunke, and T.A. Nartker, “Classes of Cost Functions for String Edit Distance,” *Algorithmica*, 18(2), 1997 ([link](#))
 - J. Kanai, S.V. Rice, T.A. Nartker, and G. Nagy, “Automated Evaluation of OCR Zoning,” *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 17(1), 1995 ([link](#))

- Conference papers:
 - S.V. Rice and S.M. Bailey, “A System for Searching Sound Palettes,” in *Proceedings of the Eleventh Biennial Symposium on Arts and Technology*, New London, CT, 2008 ([pdf](#))
 - S.V. Rice, “Braided AVL Trees for Efficient Event Sets and Ranked Sets in the Simgen III Simulation Programming Language,” in *Proceedings of the International Conference on High Level Simulation Languages and Applications*, San Diego, CA, 2007 ([pdf](#))
 - S.V. Rice, A. Marjanski, H.M. Markowitz, and S.M. Bailey, “The Simgen III Programming Language for Modular Object-Oriented Simulation,” in *Proceedings of the 2005 Winter Simulation Conference*, Orlando, FL, 2005 ([pdf](#))
 - S.V. Rice, “Frequency-Based Coloring of the Waveform Display to Facilitate Audio Editing and Retrieval,” in *Proceedings of the 119th Convention of the Audio Engineering Society*, Paper #6530, New York, 2005 ([pdf](#))
 - S.V. Rice and S.M. Bailey, “A Web Search Engine for Sound Effects,” in *Proceedings of the 119th Convention of the Audio Engineering Society*, Paper #6622, New York, 2005 ([pdf](#))
 - S.V. Rice and S.M. Bailey, “General-Purpose Real-Time Monitoring of Machine Sounds,” in *Essential Technologies for Successful Prognostics: Proceedings of the 59th Meeting of the Society for Machinery Failure Prevention Technology*, Virginia Beach, VA, 2005 ([pdf](#))
 - S.V. Rice, F.R. Jenkins, and T.A. Nartker, “The Fifth Annual Test of OCR Accuracy,” presented at the Fifth Annual Symposium on Document Analysis and Information Retrieval, Las Vegas, NV, 1996 ([pdf](#))