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
- Algorithms and data structures
- Pattern recognition, machine learning, artificial intelligence
- Database systems, information retrieval, data mining
- Programming language design, compiler construction
- Computer simulation and modeling
- C, C++, Java, Python, Javascript, PHP, Windows, Unix/Linux, Android, XML, 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

- Efficient system for storing and retrieving millions of genetic mutations
- Data-mining system for searching trillions of combinations of mutations, to find those with the strongest statistical association with phenotypes
- FindSounds.com, the leading web search engine for sound effects since 2000
- *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
- Book on optical character recognition (OCR) depicting sources of error in character recognition; this book influenced the development of CAPTCHAs

- Software toolset 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 OCR classifiers by taking a majority vote to improve accuracy
- 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

- 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.V. Rice, H. Bunke, and T.A. Nartker, "Classes of Cost Functions for String Edit Distance," *Algorithmica*, 18(2), 1997
  - 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
  - S.V. Rice, J. Kanai, and T.A. Nartker, "An Algorithm for Matching OCR-Generated Text Strings," *International Journal of Pattern Recognition and Artificial Intelligence*, 8(5), 1994

- 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 Simscript III Simulation Programming Language," in *Proceedings of the*

International Conference on High Level Simulation Languages and Applications, San Diego, CA, 2007 (pdf)

o S.V. Rice, A. Marjanski, H.M. Markowitz, and S.M. Bailey, "The Simscript III Programming Language for Modular Object-Oriented Simulation," in *Proceedings of the 2005 Winter Simulation Conference*, Orlando, FL, 2005 (pdf)

o 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)

o 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)

o 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)

o 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)