

Omid S. Jahromi, Ph.D.

9103 Ducale Way Apt. 302, Palm Beach Gardens, Florida 33418

Phone: (561) 603-2860

Email: omid@omidjahromi.com

Homepage: www.omidjahromi.com

Main Fields of Expertise

Digital Signal Processing, Image Processing, Biometric Technology, Industrial Standard Development, Sensor Networks, Acoustics, Optics, Applied Mathematics and Statistics

Education

Post Doctoral Fellowship, Artificial Perception Laboratory, University of Toronto, Toronto, Ontario, Canada (2002-2004)

Ph.D., Electrical and Computer Engineering, University of Toronto, Toronto, ON, Canada (2002)

M.S. (Highest Distinction), Electrical Engineering, Shiraz University, Shiraz, Iran (1997)

B.S. (Highest Honors), Electrical Engineering Shiraz University, Shiraz, Iran (1994)

Employment Positions

Principal Engineer, Sonavation Inc. (formerly Authorizer Technologies), Palm Beach Gardens, Florida, (9/2006 – Present)

Senior Algorithm Developer, Bioscrypt Inc. (now part of L-1 Identity Solutions), Markham, Ontario, Canada (8/2004-7/2006)

Lecturer, Department of Electrical and Computer Engineering, University of Toronto, Toronto, Ontario, Canada (1/2001-4/2004)

Research Assistant, Department of Electrical and Comp. Engineering, University of Toronto, Toronto, Ontario, Canada (1/1998-8/2002)

Invited Scientific and Advisory Positions

Expert Member of the United States liaison to the International Organization of Standards (ISO) plenary meetings on biometric standards, Berlin, Germany (June 2007)

Expert Member of the United States liaison to the International Organization of Standards (ISO) plenary meetings on biometric standard, Wellington, New Zealand (January 2007)

Member of International Organization for Standards (ISO), Joint Technical Committee on Information Technology (JTC 1) subcommittee on Biometrics (SC 37), Geneva, Switzerland (2006-present)

Member of International Committee for Information Technology Standards (INCITS) Technical Committee M1-Biometrics, Washington, DC (2005-present)

Member of International Committee for Information Technology Standards (INCITS) Task Group M1.3 on Biometric Data Interchange Formats, Washington, DC (2005-present)

Chair of Technical Session on Digital Signal Processing, IEEE International Symposium on Information Theory (ISIT 2001), Washington, DC, June 2001

Awards and Distinctions

Elevated to the grade of **Senior Member** in the IEEE (Institute of Electrical and Electronics Engineers) for “experience reflecting professional maturity and significant professional achievement”, November 2008 (As of 2009, only 8.1% of IEEE’s approximately 376,000 members hold this grade)

Recognized as a **Person with Extraordinary Ability** (“EB-1 status”) by the United States Immigration and Naturalization Service for “sustained national or international acclaim and recognition for achievements in the sciences” (2008)

Excellence-In-Teaching Citation, Office of the Chair of the Department of Electrical and Computer Engineering, University of Toronto, Toronto, Ontario, Canada (2004)

Excellence-In-Teaching Citation, Office of the Chair of the Department of Electrical and Computer Engineering, University of Toronto, Toronto, Ontario (2003)

Frank Howard Guest Graduate Bursary, University of Toronto, Toronto, Ontario, Canada (2001)

University of Toronto Doctoral Fellowship, University of Toronto, Toronto, Ontario, Canada (1998, 1999, 2000)

Graduated with **Highest Distinction**, Master of Science Program, Shiraz University, Shiraz, Iran (1997)

Graduated with **Highest Honors**, Bachelor of Science Program, Shiraz University, Shiraz, Iran (1994)

Ranked among the **Top 10 Most Outstanding Students in the Nation** in the Iranian National University Entrance Competitions (1990)

Publications

Book

Jahromi, O. S., *Multirate Statistical Signal Processing*, Springer-Verlag, Berlin, 2007

Book chapter

Jahromi, O. S. and P. Aarabi, “Distributed Signal Processing in Sensor Networks,” in *Embedded Systems Handbook, Vol. 2: Networked Embedded Systems*, R. Zurawski Ed., CRC Press, Boca Raton, Florida, 2009

Standards

Jahromi, O. S. Ed. “ANSI/INCITS 377-2009: American National Standard for Information Technology-Finger Pattern Data Interchange Format”, American National Standards Institute, June 2009

Jahromi, O. S. Ed. “American National Standard for Information Technology - Conformance Testing Methodology Standard, Part 3: Finger Pattern Conformance Testing Methodology”, American National Standards Institute, to be published

Jahromi, O. S. Ed. “International Standard on Conformance Testing for Finger Pattern Spectral Data”, International Organization for Standards (ISO), Geneva, Switzerland, in preparation

Patent applications

Jahromi, O. S. "Telescopic gun sight free of parallax error", filed with the US Patent and Trademark Office, December 2008

Jahromi, O. S. "Telescopic gun sight with optical elevation and windage adjustment", filed with the US Patent and Trademark Office, July 2008

Jahromi, O. S. “Fingerprint Image Alignment using Fourier Phase Data,” filed with the US Patent and Trademark Office by the law firm of Sterne, Kessler, Goldstein and Fox, Washington, DC (2008)

Jahromi, O. S. “Method and System for Enhanced Image Alignment,” filed with the US Patent and Trademark Office by the law firm of Sterne, Kessler, Goldstein and Fox, Washington, DC (2008)

Irving, R., O. S. Jahromi, "Fast Navigation Technique," application being prepared by the law firm of Sterne, Kessler, Goldstein and Fox, Washington, DC (2009)

Irving, R., O. S. Jahromi and D. Clark, "Fingerprint Swipe Sensor Data Streaming," application being prepared by the law firm of Sterne, Kessler, Goldstein and Fox, Washington, DC

Clark, D., R. Irving, O. S. Jahromi and J. Boudreaux, "Dynamic Optimization of Fingerprint Sensors," application being prepared by the law firm of Sterne, Kessler, Goldstein and Fox, Washington, DC

Papers published in peer-reviewed technical journals

Jahromi, O. S. and P. Aarabi, "Theory and Design of Multirate Sensor Arrays," *IEEE Transactions on Signal Processing*, Vol. 53, No. 5, pp. 1739-1753, May 2005

Jahromi, O. S., B.A. Francis and R. H. Kwong, "Spectrum Estimation Using Multirate Observations," *IEEE Transactions on Signal Processing*, Vol. 52, No. 7, pp. 1878-1890, July 2004

Jahromi, O. S., B. A. Francis and R. H. Kwong "Relative Information of Multirate Sensors," *Information Fusion*, Vol. 5, No. 2, pp. 119-129, June 2004

Jahromi, O. S., B. A. Francis and R. H. Kwong, "Algebraic Theory of Optimal Filter Banks," *IEEE Transactions on Signal Processing*, Vol. 51, No. 2, pp. 442-457, February 2003

Papers presented at preeminent technical conferences

Jahromi, O. S. and P. Aarabi, "Distributed Spectrum Estimation in Sensor Networks," *International Conference on Acoustics, Speech and Signal Processing (ICASSP 2004)*, Montreal, Quebec, May 2004

Aarabi, P., G. Shi and O. S. Jahromi, "Robust Speech Separation Using Time-Frequency Masking," *IEEE Conference on Multimedia and Expo (ICME 2003)*, Baltimore, MD, July 2003

Jahromi, O. S. and P. Aarabi, "Time Delay Estimation and Signal Reconstruction using Multirate Measurements," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2003)*, Hong Kong, April 2003

Jahromi, O. S., B. A. Francis and R. H. Kwong, "Multirate Spectral Estimation," *Pacific Rim Conference on Communications, Computers and Signal Processing (PACRIM 2001)*, Victoria, BC, August 2001

Jahromi, O. S., B. A. Francis and R. H. Kwong, "Multirate Signal Estimation," *Canadian Conference on Electrical and Computer Engineering (CCECE 2001)*, Toronto, ON, May 2001

Jahromi, O. S., R. H. Kwong and B. A. Francis, "Information Theory of Multirate Systems," *International Symposium on Information Theory (ISIT 2001)*, Washington, DC, June 2001

Jahromi, O. S., B. A. Francis and R. H. Kwong, "Algebraic Theory of Optimal Filter Banks," *International Conference on Acoustics, Speech and Signal Processing (ICASSP 2000)*, Istanbul, Turkey, June 2000

Jahromi, O. S. and B. A. Francis, "An Information Theoretic Method for Designing Multiresolution Principal Component Transforms," *International Joint Conference on Neural Networks (IJCNN 1999)*, Washington, DC, July 1999

Jahromi, O. S., M.A. Masnadi-Shirazi and M. Fu, "A Fast $O(N)$ Algorithm for Signal-Adaptive Filter Bank Design," *International Conference on Acoustics, Speech and Signal Processing (ICASSP 1998)*, Seattle, WA, May 1998

Technical reports, white papers, etc.

Jahromi, O. S., "Fingerprint Extract and Match Process", White Paper, Sonavation Inc., Palm Beach Gardens, FL, 8 pp., August 2008

Jahromi, O. S., "Fingerprint Image Reconstruction Using Phase Transform", White Paper, Sonavation Inc., Palm Beach Gardens, FL, 7 pp., August 2008

Jahromi, O. S., "Matching Algorithm Performance System (MAPS)", Technical Report, Sonavation Inc., Palm Beach Gardens, FL, 10 pp., March 2008

Jahromi, O. S., "Bioscrypt Core Algorithm Performance and Interoperability", Technical Report, Bioscrypt Inc., Markham, ON, 38 pp., December 2005 (confidential)

Jahromi, O. S., "Fingerprint quality assessment and sensor parameter optimization", Technical Report, Bioscrypt Inc., Markham, ON, 16 pp., September 2005 (confidential)

Jahromi, O. S., R. McIver, C. Soutar, A. Stoianov and V. Kolesnikov, "Biometric Key Binding", Technical Report, Industrial Research Partnership Program (IRAP) Project 520825, National Research Council of Canada, Ottawa, 68 pp., March 2005 (confidential)

Jahromi, O. S., "Theory of Optimal FIR Multirate Systems," Technical Report, Department of Electrical and Computer Engineering, University of Toronto, March 2000

Jahromi, O. S., "Non-uniform Signaling Over Band-limited Channels: A Multirate Signal Processing Approach," Technical Report, Department of Electrical and Computer Engineering, University of Toronto, April 1998

Invited Talks

Biometrics: Who is watching you? *Café Scientifique*, Ontario Science Centre, Toronto, August 2005

Biometric Identity Verification, IEEE Toronto Signals and Applications Chapter and IEEE Toronto Computer Chapter, University of Toronto, Toronto, Ontario, April, 2005

Signal Processing for Sensor Networks, Department of Electrical and Computer Engineering, Boston University, Boston, MA, April 2004

Hypothesis Testing: An Introduction, Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Alberta, October 2002.

Theory of Multirate Statistical Signal Processing, Department of Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, April 19, 2002

What Is an Optimal Filter Bank? Department of Electrical and Computer Engineering, University of Toronto, Toronto, Ontario, April 2000

Theory of Optimal FIR Multirate Systems, Department of Electrical and Computer Engineering, University of Toronto, Toronto, Ontario, March 2000

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