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Personal Information

Birth: September 21st, 1977, Shiraz, Iran
Citizenship: Iranian
Marital status: Married, no children
Languages: Persian (maternal), English (fluent), French (intermediate), Arabic (basic)

Current Status

Assistant Professor and on faculty at Shiraz University, since September 2008

Research Interests

Statistical signal processing (especially for biomedical applications), blind source separation and classification, time-frequency analysis and multirate systems, software defined radio systems.

Education

PhD, Electrical Engineering, Sharif University of Technology, Tehran, Iran *2003–2008*
PhD, Signal Processing and Telecommunications, GIPSA-lab, INPG, Grenoble, France *2005–2008*

Pursued a double PhD degree from the Institut National Polytechnique de Grenoble (INPG) and Sharif University of Technology; graduated with Honor

Major: Statistical signal processing & bioelectrics

MSc, Electrical Engineering, Sharif University of Technology, Tehran, Iran *2000–2003*

Major: Bioelectrics

BSc, Shiraz University, Shiraz, Iran *1996–2000*

Major: Electronics

High School, Exceptional Talents High School (NODET), Shiraz, Iran *1992–1996*

Major: Mathematics & Physics

Honors and Awards

- Biyearly selected PhD thesis award of INPG (Prix de Thèse de Grenoble INP), in Signal Processing and Telecommunications, Grenoble, France, 2010
- First Place Award in Electrical Engineering, Dr. Mojtahedi Innovation Award, Sharif University of Technology Association (SUTA), Tehran, Iran, 2010
- Gold medal of Best Young Inventor from the World Intellectual Property Organization (WIPO) on the occasion of the 23rd Khwarizmi International contest, Tehran, Iran, 2010
- Young Scientist Award from the Academy of Sciences for the Developing World (TWAS), Tehran, Iran, 2010
- Second Place Award of Innovation, 23rd Khwarizmi International Award (KIA), Tehran, Iran, 2010
- Rhône-Alpes region scholarship, Grenoble, France, 2008
- Eiffel PhD Scholarship of Excellence from the French government, Grenoble, France, 2007
- PhD scholarship from the French government (BGF), 2005
- PhD scholarship from Sharif University of Technology, Tehran, Iran, 2004
- PhD scholarship and post-doctoral faculty position from Shiraz University, Shiraz, Iran, 2003

Research Fields & Professional Experience

Signal Processing Center, School of Electrical & Computer Engineering, Shiraz University, Shiraz, Iran *2010–present*

- Signal Processing Center (SPC) founder and manager
- Digital system design
- Software Defined Radio Systems
- Digital Communication Systems

School of Electrical & Computer Engineering, Shiraz University, Shiraz, Iran *2008–present*

- Fetal ECG monitoring systems
- Blind and semi-blind source separation
- Fetal EEG monitoring

MindChild Medical, Inc., North Andover, MA, USA *2008–present*

- Technology adviser and algorithm designer for fetal ECG monitoring systems

GIPSA-lab, INPG, Grenoble, France *2005–2008*

- Modeling and denoising of electrocardiogram (ECG) signals of adults and fetuses
- Blind and semi-blind source separation of biosignals

Sharif University of Technology, Tehran, Iran *2000–2008*

- Non-invasive extraction and processing of fetal cardiac signals from an array of maternal abdominal sensors (PhD thesis); joint project with GIPSA-lab
- Classification of EEG Signals for Brain-Computer Interface (BCI) Applications
- Detection of Sleep Apnea from Biomedical Recordings. Joint work with the University of Rennes (France)
- Applications of Non-Uniform Sampling Techniques in Signal Reconstruction

- Design and Implementation of a Base-Band Software Radio System (Project Manager)
- Design and Implementation of High Rate Data Acquisition PCI Cards (Project Manager)
- Implementation of High Rate FFT Cores for FPGA Platforms
- Base-Band Simulation of a Digital Receiver

- Design of Anemometry Systems, Based on the Hotwire Technique
- Implementation of a Portable Digital Hotwire Anemometry System

Publications

Thesis & Final Projects

- [1] R. Sameni, “Extraction of Fetal Cardiac Signals from an Array of Maternal Abdominal Recordings,” Ph.D. dissertation, Sharif University of Technology – Institut National Polytechnique de Grenoble, July 2008. [Online]. Available: <http://www.sameni.info/Publications/Thesis/PhDThesis.pdf>
- [2] —, “Discrimination of EEG Signals during the Performance of Different Mental Tasks,” Master’s thesis, Sharif University of Technology, May 2003.
- [3] R. Sameni and S. Mansouri, “Designing a Training Board for the 8x51 Microcontroller Series,” September 2000, Bachelor’s final project, Shiraz University.

Patents

- [4] R. Sameni, C. Jutten, M. Shamsollahi, and G. Clifford, “Extraction of Fetal Cardiac Signals,” U.S. Patent US 2010/0 137 727 A1, June 3, 2010, (provisional application filed Nov. 21 2008, No. 61/116,870).

Journals

- [5] L. Moraru, R. Sameni, U. Schneider, J. Haueisen, E. Schleußner, and D. Hoyer, “Validation of fetal auditory evoked cortical responses to enhance the assessment of early brain development using fetal MEG measurements,” *Physiological Measurements*, vol. 32, no. 11, pp. 1847–1868, October 2011.
- [6] G. Clifford, R. Sameni, J. Ward, J. Robinson, and A. J. Wolfberg, “Clinically accurate fetal ECG parameters acquired from maternal abdominal sensors,” *American Journal of Obstetrics and Gynecology*, vol. 205, no. 1, pp. 47.e1–47.e5, July 2011.
- [7] R. Sameni and G. D. Clifford, “A Review of Fetal ECG Signal Processing; Issues and Promising Directions,” *The Open Pacing, Electrophysiology & Therapy Journal (TOPETJ)*, vol. 3, pp. 4–20, November 2010.
- [8] G. Clifford, S. Nemati, and R. Sameni, “An Artificial Vector Model for Generating Abnormal Electrocardiographic Rhythms,” *Physiological Measurements*, vol. 31, no. 5, pp. 595–609, May 2010.
- [9] R. Sameni, C. Jutten, and M. B. Shamsollahi, “A Deflation Procedure for Subspace Decomposition,” *IEEE Transactions on Signal Processing*, vol. 58, no. 4, pp. 2363–2374, April 2010.
- [10] T. Tsalaila, R. Sameni, S. Sanei, C. Jutten, and J. Chambers, “Sequential Blind Source Extraction For Quasi-Periodic Signals With Time-Varying Period,” *IEEE Trans. Biomed. Eng.*, vol. 56, no. 3, pp. 646–655, March 2009.
- [11] R. Sameni, C. Jutten, and M. B. Shamsollahi, “Multichannel Electrocardiogram Decomposition Using Periodic Component Analysis,” *IEEE Trans. Biomed. Eng.*, vol. 55, no. 8, pp. 1935–1940, August 2008.
- [12] R. Sameni, M. B. Shamsollahi, and C. Jutten, “Model-based Bayesian filtering of cardiac contaminants from biomedical recordings,” *Physiological Measurement*, vol. 29, no. 5, pp. 595–613, May 2008.

- [13] R. Sameni, M. B. Shamsollahi, C. Jutten, and G. D. Clifford, "A Nonlinear Bayesian Filtering Framework for ECG Denoising," *IEEE Trans. Biomed. Eng.*, vol. 54, no. 12, pp. 2172–2185, December 2007.
- [14] R. Sameni, G. D. Clifford, C. Jutten, and M. B. Shamsollahi, "Multichannel ECG and Noise Modeling: Application to Maternal and Fetal ECG Signals," *EURASIP Journal on Advances in Signal Processing*, vol. 2007, pp. Article ID 43 407, 14 pages, 2007, ISSN 1687-6172, doi:10.1155/2007/43407. [Online]. Available: <http://www.hindawi.com/GetArticle.aspx?doi=10.1155/2007/43407>

Selected Conference Papers

- [15] C. McDonnell, G. Clifford, R. Sameni, J. Ward, J. Robertson, and A. Wolfberg, "Comparison of abdominal sensors to a fetal scalp electrode for fetal ST analysis during labor," in *American Journal of Obstetrics and Gynecology*, vol. 204, no. 1. Society for Maternal-Fetal Medicine, January 2011, pp. S256–S256.
- [16] R. Sameni, G. D. Clifford, J. Ward, J. Robertson, C. Pettigrew, and A. J. Wolfberg, "Accuracy of fetal heart rate acquired from sensors on the maternal abdomen compared to a fetal scalp electrode," in *American Journal of Obstetrics and Gynecology*, vol. 201, no. 6. Chicago, IL: Society for Maternal-Fetal Medicine, December 2009, pp. S241–S241.
- [17] G. D. Clifford, R. Sameni, J. Ward, J. Robertson, C. Pettigrew, and A. J. Wolfberg, "Comparing the fetal ST-segment acquired using a FSE and abdominal sensors," in *American Journal of Obstetrics and Gynecology*, vol. 201, no. 6. Chicago, IL: Society for Maternal-Fetal Medicine, December 2009, pp. S242–S242.
- [18] C. Gouy-Pailler, R. Sameni, M. Congedo, and C. Jutten, "Iterative Subspace Decomposition for Ocular Artifact Removal from EEG Recordings," in *Proc. of the 8th Intl. Conf. on Independent Component (ICA 2009)*, Paraty, Brazil, 2009, pp. 419–426.
- [19] L. Moraru, R. Sameni, U. Schneider, C. Jutten, J. Haueisen, and D. Hoyer, "Identification of fetal auditory evoked cortical responses using a denoising method based on periodic component analysis," in *Proceedings of the 4th European Conference of the International Federation for Medical and Biological Engineering (ECIFMBE 2008)*, Antwerp, Belgium, 2008, pp. 1390–1393.
- [20] M. Congedo, C. Jutten, R. Sameni, and C. Gouy-Pailler, "A new General Weighted Least-Squares Algorithm for Approximate Joint Diagonalization," in *Proceedings of the 4th International BCI Workshop*, Graz, Austria, 2008.
- [21] G. Clifford, S. Nemati, and R. Sameni, "An Artificial Multi-Channel Model for Generating Abnormal Electrocardiographic Rhythms," in *Computers in Cardiology, 2008*, Bologna, Italy, September 14–17 2008, pp. 773–776.
- [22] L. Amini, R. Sameni, C. Jutten, G. Hossein-Zadeh, and H. Soltanian-Zadeh, "MR Artifact Reduction in the Simultaneous Acquisition of EEG and fMRI of Epileptic Patients," in *EUSIPCO2008 - 16th European Signal Processing Conf.*, Lausanne, Switzerland, August 25-29 2008.
- [23] R. Sameni, M. Shamsollahi, and C. Jutten, "Multi-Channel Electrocardiogram Denoising Using a Bayesian Filtering Framework," in *Proc. of the 33rd Annual International Conference on Computers in Cardiology*, Valencia, Spain, September 17-20 2006, pp. 185–188. [Online]. Available: <http://cinc.mit.edu/archives/2006/>
- [24] C. Jutten, R. Sameni, and H. Hauksdóttir, "On the Relevance of Independent Components," in *Proc. of the ICA Research Network International Workshop (ICArn 2006)*, Liverpool, UK, September 18-19 2006, pp. 1–8.
- [25] R. Sameni, C. Jutten, and M. B. Shamsollahi, "What ICA Provides for ECG Processing: Application to Noninvasive Fetal ECG Extraction," in *Proc. of the International Symposium on Signal Processing and Information Technology (ISSPIT'06)*, Vancouver, Canada, August 2006, pp. 656–661.
- [26] R. Sameni, F. Vrins, F. Parmentier, C. Hérial, V. Vigneron, M. Verleysen, C. Jutten, and M. Shamsollahi, "Electrode Selection for Noninvasive Fetal Electrocardiogram Extraction using Mutual Information Criteria," in *Proc. of the 26th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering (MaxEnt 2006)*, vol. 872, CNRS, Paris, France, July 8-13 2006, pp. 97–104.
- [27] R. Sameni, M. B. Shamsollahi, C. Jutten, and M. Babaie-Zadeh, "Filtering Noisy ECG Signals Using the Extended Kalman Filter Based on a Modified Dynamic ECG Model," in *Proceedings of the 32nd Annual International Conference on Computers in Cardiology*, Lyon, France, September 25-28 2005, pp. 1017–1020.

- [28] R. Sameni, M. B. Shamsollahi, and C. Jutten, "Filtering Electrocardiogram Signals Using the Extended Kalman Filter," in *Proceedings of the 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, Shanghai, China, September 1-4 2005, pp. 5639–5642.
- [29] R. Sameni, M. Shamsollahi, and L. Senhadji, "Processing Polysomnographic Signals, using Independent Component Analysis," in *Proc. Of the International Conference on Biomedical Engineering (BIOMED 2004)*, Innsbruck, Austria, February 2004, pp. 193–196.
- [30] R. Sameni and M. Shamsollahi, "Discrimination Of EEG Signals During The Performance Of Different Mental Tasks," in *Proc. of the World Congress on Medical Physics and Biomedical Engineering*, Sydney, Australia, August 24-29 2003, [CD-ROM] ISBN 1877040142, Poster Paper No. 4251.

Selected Technical Reports

- [31] R. Sameni, "Writing Efficient Matlab Codes," Lecture Notes, Sharif University of Technology, Tech. Rep., 2006.
- [32] —, "Discrimination of EEG Patterns during the Performance of Different Mental Activities," Research Project Report, Sharif University of Technology, Tech. Rep., 2004.
- [33] —, "Design and Implementation of a Portable Hotwire Anemometer," IROST, Tech. Rep., November 2001.
- [34] —, "A Kalman Notch Filter for Removing Power-Line Noise from Biomedical Signals," GIPSA-LAB, INP-Grenoble, Tech. Rep., October 2007.
- [35] —, "Removing ECG Contaminants from Multichannel Recordings by Deflation," GIPSA-LAB, INP-Grenoble, Tech. Rep., September 2007.
- [36] —, "Multipole Expansion of Body Surface Potentials: An ICA Oriented Formulation (Part I)," GIPSA-LAB, INP-Grenoble, Tech. Rep., November 2007, Technical Report.
- [37] —, "Removing ECG Artifacts from EEG Recordings," GIPSA-LAB, INP-Grenoble, Tech. Rep., May 2006, Technical Report.
- [38] —, "Analysis of Iterative Approaches of Interpolation-Distortion Compensation," GIPSA-LAB, INP-Grenoble, Tech. Rep., March 2004, DSPII course term paper, Sharif University of Technology.

Article Reviews

IEEE Trans. Biomed. Eng; IEEE Trans. Signal Processing; IEEE Signal Processing Letters; IOP Physiological Measurements; Elsevier Signal Processing; Elsevier Applied Soft Computing; Hindawi International Journal of Quality, Statistics, and Reliability; several peer reviewed conferences

Teaching Experience

- Biological System Modeling (Graduate course/two semesters)
- Signal Processing in Time, Frequency, and Space (Graduate course/three semesters)
- Signals & Systems (BSc course/four semesters)
- Electrical Circuit Theory (BSc course/two semesters)
- Linear Control Systems (BSc course/three semesters)
- Technical Communication (BSc course/two semesters)
- Digital System Design (BSc course/three semesters)
- Principles of Electrical Engineering (BSc course/two semesters)
- Biomedical Signal Processing (MSc course teaching assistant/ one semester)
- C & C++ Programming (Training course for BSc and MSc students)
- Mathematics & Physics (High school course)

Programming Languages

C, C++, Matlab, Verilog (HDL), Mathcad, and several Assembly languages.

Memberships

Member of the Institute of Electrical and Electronics Engineering (IEEE), since 2001.

References

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