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Personal Information

Birth: September 21st, 1977, Shiraz, Iran
Citizenship: Iranian
Language: Persian (maternal), English (fluent), French (intermediate), Arabic (basic)

Research Interests

Statistical Signal Processing, Blind Source Separation and Classification, Time-Frequency Analysis and Multi-Rate 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 joint PhD degree from the Institut National Polytechnique de Grenoble (INPG) and Sharif University of Technology. The PhD thesis was jointly supervised by Dr. M.B Shamsollahi and Prof. C. Jutten.

Major: Statistical signal processing

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

BSc, Shiraz University, Shiraz, Iran *1996–2000*
Major: Electronics

High School, Exceptional Talents High School (NODET), Shiraz, Iran *1992–1996*
Major: Mathematics & Physics

Honors

- Received the Rhône-Alpes region scholarship, 2008.
- Received the Eiffel PhD Scholarship of Excellence from the French government, 2007.
- Received a PhD scholarship from the French government (BGF), 2005.
- Received a scholarship from Sharif University of Technology, 2004.
- Received a faculty position in Shiraz University, 2003.
- Ranked 4th among the BSc graduates of Electrical Engineering of Shiraz University, 2000.
- Participated in the national stage of the Computer & Information Olympiad, 1995.

Research Fields & Professional Experience

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.

Iranian Research Organization for Science & Technology (IROST), Tehran, Iran

2000-2002

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

Basamad Negar Ltd., Tehran, Iran

2001-2005

- 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.

Publications

Thesis

- R. Sameni. *Extraction of Fetal Cardiac Signals from an Array of Maternal Abdominal Recordings*, PhD thesis, Sharif University of Technology - Institut National Polytechnique de Grenoble, July 2008.
- R. Sameni. *Discrimination of EEG Signals during the Performance of Different Mental Tasks*, MSc. thesis, Sharif University of Technology, May 2003.
- R. Sameni and Sh. Mansouri *Designing a Training Board for the 8x51 Microcontroller Series*, BSc. final project, Shiraz University, September 2000.

Patents

- R. Sameni, M.B. Shamsollahi, C. Jutten, and G.D. Clifford, Noninvasive Extraction of Fetal Cardiac Signals from Maternal Abdominal Recordings, 2008 [in progress].
- R. Sameni, M.B. Shamsollahi, C. Jutten, and G.D. Clifford, A Deflation Procedure for Subspace Decomposition, 2008 [in progress].

Journals

- T. Tsalaile, R. Sameni, S. Sanei, C. Jutten, and J. Chambers, Sequential Blind Source Extraction for Quasi-Periodic Signals with Time-Varying Period, [to appear in] *IEEE Transactions on Biomedical Engineering*, 2009.
- R. Sameni, C. Jutten, and M.B. Shamsollahi, Multichannel Electrocardiogram Decomposition using Periodic Component Analysis, [to appear in] *IEEE Transactions on Biomedical Engineering*, July, 2008.
- R. Sameni, M.B. Shamsollahi, and C. Jutten, Model-Based Bayesian Filtering of Cardiac Contaminants from Biomedical Recordings, *Physiological Measurements*, Vol. 29, No. 5, pp. 595–613, May 2008.
- R. Sameni, M.B. Shamsollahi, C. Jutten, and G.D. Clifford, A Nonlinear Bayesian Filtering Framework for ECG Denoising, *IEEE Transactions on Biomedical Engineering*, Vol. 54, No. 12, pp. 2172–85, Dec. 2007.
- 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*, Volume 2007, Article ID 43407, doi:10.1155/2007/43407.

Conferences

- G.D. Clifford and R. Sameni, An Artificial Multi-Channel Model for Generating Abnormal Electrocardiographic Rhythms, *The 35th Annual International Conference on Computers in Cardiology, Bologna, Italy*, Sep. 14-17, 2008 [to appear].
- L. Amini, R. Sameni, C. Jutten, G.A. Hossein-Zadeh and H. Soltanian-Zadeh, MR Artifact Reduction in the Simultaneous Acquisition of EEG and fMRI of Epileptic Patients, *Proc. of the 16th European Signal Processing Conference (EUSIPCO2008), Lausanne, Switzerland*, Aug. 25-29, 2008 [to appear].
- R. Sameni, M.B. Shamsollahi, C. Jutten, Multi-Channel Electrocardiogram Denoising Using a Bayesian Filtering Framework, *Proc. of the 33rd Annual International Conference on Computers in Cardiology, Valencia, Spain*, Sep. 17-20, 2006., vol. 33, pp. 185–188.
- C. Jutten, R. Sameni, and H. Hauksdottir. 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, [Invited paper].
- R. Sameni, C. Jutten, and M. B. Shamsollahi, What ICA Provides for ECG Processing: Application to Noninvasive Fetal ECG Extraction, *Proc. of the International Symposium on Signal Processing and Information Technology (ISSPIT'06), Vancouver, Canada*, Aug. 27-30, 2006, pp. 656–661.
- R. Sameni, F. Vrins, F. Parmentier, C. Hérail, V. Vigneron, M. Verleysen, C. Jutten, and M.B. Shamsollahi, Electrode Selection for Noninvasive Fetal Electrocardiogram Extraction using Mutual Information Criteria, *Proc. of the 26th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering (MaxEnt 2006), CNRS, Paris, France*, Jul. 8-13, 2006, vol. 872, pp. 97–104.
- R. Sameni, M.B. Shamsollahi, C. Jutten, Filtering Noisy ECG Signals Using the Extended Kalman Filter Based on a Dynamic ECG Model, *Proc. of the 32nd Annual International Conference on Computers in Cardiology, Lyon, France*, Sep. 25-28, 2005, vol. 32, pp. 1017–1020.
- R. Sameni, M.B. Shamsollahi, C. Jutten, Filtering Electrocardiogram Signals Using the Extended Kalman Filter, *Proc. of the 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS), Shanghai, China*, Sep. 1-4, 2005, pp. 5639–5642.

- R. Sameni, M.B Shamsollahi, L. Senhadji, Processing Polysomnographic Signals, using Independent Component Analysis, *Proc. Of the International Conference on Biomedical Engineering (BIOMED 2004)*, Innsbruck, Austria, Feb. 2004, pp. 193–196.
- R. Sameni, M.B Shamsollahi, Discrimination Of EEG Signals During The Performance Of Different Mental Tasks, *Proc. of the World Congress on Medical Physics and Biomedical Engineering, Sydney, Australia*, [CD-ROM] ISBN 1877040142, Paper No. 4251, Aug. 24-29, 2003.

Technical Reports

- R. Sameni, Writing Efficient Matlab Codes, *Lecture Notes, Sharif University of Technology*, Tehran, Iran, 2006.
- R. Sameni, Discrimination of EEG Patterns during the Performance of Different Mental Activities, *Research Project Report, Sharif University of Technology*, Tehran, Iran, 2004.
- R. Sameni, Design and Implementation of a Portable Hotwire Anemometer, *Technical Report, IROST*, Iran, Nov. 2001.

Teaching Experience

- Principles of Electrical Engineering (BSc course/two semesters, 102 hours)
- Signals & Systems (BSc course teaching assistant/more than 20 hours)
- Biomedical Signal Processing (MSc course teaching assistant, one semester)
- C & C++ Programming (Training course for BSc and MSc students/10 hours)
- Mathematics & Physics (High school course/20 hours)
- Supervision of several BSc projects

Programming Languages

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

Memberships

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

References

Dr. Mohammad B. Shamsollahi
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