Reza Sameni, PhD

Associate Professor, IEEE Senior Member
Department of Biomedical Informatics
School of Medicine, Emory University
101 Woodruff Circle
Atlanta, GA 30322, US

Email: rsameni@dbmi.emory.edu
Web: www.sameni.info
The Alphanumerics Lab: alphanumerics.bmi.emory.edu
Profiles: ORCID, Google Scholar, LinkedIn, ResearchGate

CAREER

- Associate Professor, Department of Biomedical Informatics, Emory University School of Medicine, GA, US, *Jul 2020–present*
- Invited Researcher, GIPSA-lab, Université Grenoble Alpes, Grenoble, France, *Sep 2018–Jul 2020*
- Associate Professor, School of ECE, Shiraz University, Shiraz, Iran, *Sep 2008–Sep 2019*

EDUCATION

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

  Double PhD degree (*co-tutelle*) from Sharif University of Technology and Institut National Polytechnique de Grenoble (INPG); graduated with Honor.

  Major: Statistical Signal Processing & Bioelectrical Engineering

  Thesis: Non-invasive extraction and processing of fetal cardiac signals from an array of maternal abdominal sensors
- **MSc in Electrical Engineering, Sharif University of Technology, Tehran, Iran** ***2000–2003***

  Major: Biomedical Engineering

  Thesis: Classification of EEG signals for brain-computer interface (BCI) applications
- **BSc in Electrical Engineering, Shiraz University, Shiraz, Iran** ***1996–2000***

  Major: Electronics

HONORS

- Distinguished Academic Faculty of Electrical & Computer Engineering (awarded annually by the Provost), Shiraz University, Iran, 2012
- 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 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
- Research assistant scholarship from Sharif University of Technology, Tehran, Iran, 2004
- PhD scholarship and post-doctoral faculty position from Shiraz University, Shiraz, Iran, 2003

TEACHING

Courses taught:

Graduate

Estimation Theory & Optimal Filtering; Biological Systems Modeling; Signal Processing in Time, Frequency, and Space; Digital Signal Processing; Reconfigurable Architectures

Undergraduate

Signals & Systems; Signal Processing Lab; Circuit Theory; Electrical Circuits Lab; Linear Control Systems; Technical Communication; Digital System Design; Digital System Design Lab; Principles of Electrical Engineering

Invited Talks and Workshops

1. *A Nonlinear Bayesian Filtering Framework for the Filtering of Noisy ECG Signals*, UCL, Louvain-la-Neuve, Belgium, April 21, 2006
2. *Workshop on Blind Source Separation and Independent Component Analysis: Theory, Applications and Perspectives*, 15th Iranian Conference on Electrical Engineering (ICEE 2007), Iran Telecom Research Center (ITRC), May 13, 2007
3. *A Biomedical Signal Processing Project from Research to Production*, Shiraz University, January 13, 2009
4. *Introduction to Biomedical Engineering*, Iranian Telecommunication Manufacturing Company (ITMC), December 8, 2010
5. *Cardiac Signal Processing*, Interdisciplinary Summer School, Shiraz University, July 16, 2012
6. *Advances in electrocardiogram signal processing and analysis*, International Workshop on Signal Processing (IWSP 2017), Tehran, Iran, May 10, 2017
7. *Introduction to Blind Source Separation*, 20th Workshop on Applied Stochastic Processes, Shiraz, Iran, April 2018
8. *Fetal Cardiac Signal Processing Techniques*, Invited Lecturer in the International Summer School on Technologies and Signal Processing, Pula, Sardinia, Italy, July 2–6, 2018
9. *Methods & Technologies for Prenatal Cardiac Monitoring*, Invited Talk, Department of Biomedical Informatics, Emory University, June 4, 2019

RESEARCH

Interests

Statistical signal and data processing (especially for biomedical applications), system and data modeling, digital system design.

Publications

Check my Google Scholar profile for an up to date list of publications.

Patents

P1 R. Sameni, C. Jutten, M. Shamsollahi, and G. Clifford. Extraction of Fetal Cardiac Signals, June 2010a. Licensed to MindChild Medical Inc

Book Chapters

B1 R. Sameni. *Noninvasive Fetal Electrocardiography: Models, Technologies, and Algorithms*, pages 99–146. Springer International Publishing, Cham, 2021a. ISBN 978-3-030-54403-4. URL https://doi.org/10.1007/978-3-030-54403-4_5

Journal Papers

J1 C. Hegde, R. Sameni, A. B. Rad, and G. D. Clifford. Modeling Social Distancing and Quantifying Epidemic Disease Exposure in a Built Environment. *IEEE Journal of Selected Topics in Signal Processing*, pages 1–12, 2022. doi: 10.1109/jstsp.2022.3145622. URL https://doi.org/10.1109/jstsp.2022.3145622

J2 E. Grooby, C. Sitaula, D. Fattahi, R. Sameni, K. Tan, L. Zhou, A. King, A. Ramanathan, A. Malhotra, G. A. Dumont, and F. Marzbanrad. Real-Time Multi-Level Neonatal Heart and Lung Sound Quality Assessment for Telehealth Applications. *IEEE Access*, 10:10934–10948, 2022. doi: 10.1109/access.2022.3144355. URL https://doi.org/10.1109/access.2022.3144355

J3 J. H. Oliveira, F. Renna, P. Costa, D. Nogueira, C. Oliveira, C. Ferreira, A. Jorge, S. Mattos, T. Hatem, T. Tavares, A. Elola, A. Rad, R. Sameni, G. D. Clifford, and M. T. Coimbra. The CirCor DigiScope dataset: From murmur detection to murmur classification. *IEEE Journal of Biomedical and Health Informatics*, pages 1–1, 2021. doi: 10.1109/jbhi.2021.3137048. URL https://doi.org/10.1109/jbhi.2021.3137048

J4 R. Sameni. Model-based Prediction and Optimal Control of Pandemics by Non-pharmaceutical Interventions. *IEEE Journal of Selected Topics in Signal Processing*, pages 1–11, 2021b. URL https://doi.org/10.1109/jstsp.2021.3129118

J5 A. B. Rad, C. Galloway, D. Treiman, J. Xue, Q. Li, R. Sameni, D. Albert, and G. D. Clifford. Atrial fibrillation detection in outpatient electrocardiogram monitoring: An algorithmic crowdsourcing approach. *PLOS ONE*, 16(11):e0259916, Nov. 2021. URL https://doi.org/10.1371/journal.pone.0259916

J6 E. Sulas, M. Urru, R. Tumbarello, L. Raffo, R. Sameni, and D. Pani. A non-invasive multimodal foetal ECG-Doppler dataset for antenatal cardiology research. *Scientific Data*, 8(1), jan 2021. URL https://doi.org/10.1038/s41597-021-00811-3

J7 S. Tomassini, A. Sbrollini, A. Strazza, R. Sameni, I. Marcantoni, M. Morettini, and L. Burattini. AdvFPCG-delineator: Advanced delineator for fetal phonocardiography. *Biomedical Signal Processing and Control*, 61: 102021, Aug 2020. URL https://doi.org/10.1016/j.bspc.2020.102021

J8 F. Jamshidian-Tehrani, R. Sameni, and C. Jutten. Temporally Nonstationary Component Analysis; Application to Noninvasive Fetal Electrocardiogram Extraction. *IEEE Transactions on Biomedical Engineering*, 67(5): 1377–1386, 2020. URL http://dx.doi.org/10.1109/TBME.2019.2936943

J9 A. Zollanvari, A. P. James, and R. Sameni. A theoretical analysis of the peaking phenomenon in classification. *Journal of Classification*, Jul 2019. ISSN 1432-1343. URL https://doi.org/10.1007/s00357-019-09327-3

J10 F. Jamshidian-Tehrani and R. Sameni. Fetal ECG extraction from time-varying and low-rank noninvasive maternal abdominal recordings. *Physiological Measurement*, Nov 2018. URL http://dx.doi.org/10.1088/1361-6579/aaef5d

J11 F. Karimzadeh, R. Boostani, E. Seraj, and R. Sameni. A distributed classification procedure for automatic sleep stage scoring based on instantaneous electroencephalogram phase and envelope features. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 26(2):362–370, Feb 2018. ISSN 1534-4320. URL https://doi.org/10.1109/TNSRE.2017.2775058

J12 R. Sameni and E. Seraj. A robust statistical framework for instantaneous electroencephalogram phase and frequency estimation and analysis. *Physiological Measurement*, 38(12):2141–2163, 2017. URL http://dx.doi.org/10.1088/1361-6579/aa93a1

J13 M. Fatemi and R. Sameni. An Online Subspace Denoising Algorithm for Maternal ECG Removal from Fetal ECG Signals. *Iranian Journal of Science and Technology, Transactions of Electrical Engineering*, 2017:1–15, April 2017. URL http://dx.doi.org/10.1007/s40998-017-0018-4

J14 H. Hassani Saadi, R. Sameni, and A. Zollanvari. Interpretive time-frequency analysis of genomic sequences. *BMC Bioinformatics*, 18(4):154, 2017. ISSN 1471-2105. URL http://dx.doi.org/10.1186/s12859-017-1524-0

J15 E. Seraj and R. Sameni. Robust electroencephalogram phase estimation with applications in brain-computer interface systems. *Physiological Measurement*, 38(3):501, 2017. URL https://doi.org/10.1088/1361-6579/aa5bba

J16 R. Sameni. Online filtering using piecewise smoothness priors: Application to normal and abnormal electrocardiogram denoising. *Signal Processing*, 133(4):52 – 63, April 2017. ISSN 0165-1684. URL https://doi.org/10.1016/j.sigpro.2016.10.019

J17 C. Liu, D. Springer, Q. Li, B. Moody, R. A. Juan, F. J. Chorro, F. Castells, J. M. Roig, I. Silva, A. E. W. Johnson, Z. Syed, S. E. Schmidt, C. D. Papadaniil, L. Hadjileontiadis, H. Naseri, A. Moukadem, A. Dieterlen, C. Brandt, H. Tang, M. Samieinasab, M. R. Samieinasab, R. Sameni, R. G. Mark, and G. D. Clifford. An open access database for the evaluation of heart sound algorithms. *Physiological Measurement*, 37(12):2181–2213, 2016. URL https://doi.org/10.1088/0967-3334/37/12/2181

J18 J. Behar, T. Zhu, J. Oster, A. Niksch, D. Y. Mah, T. Chun, J. Greenberg, C. Tanner, J. Harrop, R. Sameni, J. Ward, A. J. Wolfberg, and G. D. Clifford. Evaluation of the fetal QT interval using non-invasive fetal ECG technology. *Physiological Measurement*, 37(9):1392–1403, September 2016. URL https://doi.org/10.1088/0967-3334/37/9/1392

J19 H. Biglari and R. Sameni. Fetal motion estimation from noninvasive cardiac signal recordings. *Physiological Measurement*, 37(11):2003–2023, November 2016. URL https://doi.org/10.1088/0967-3334/37/11/2003

J20 E. Nikahd, P. Behnam, and R. Sameni. High-speed hardware implementation of fixed and runtime variable window length 1-d median filters. *IEEE Transactions on Circuits and Systems II: Express Briefs*, 63(5):478–482, 2016. URL https://doi.org/10.1109/TCSII.2015.2504945

J21 F. Razavipour and R. Sameni. A Study of Event Related Potential Frequency Domain Coherency using Multichannel Electroencephalogram Subspace Analysis. *Journal of Neuroscience Methods*, 249:22–28, July 2015. URL http://dx.doi.org/10.1016/j.jneumeth.2015.03.037

J22 R. Sameni and C. Gouy-Pailler. An Iterative Subspace Denoising Algorithm for Removing Electroencephalogram Ocular Artifacts. *Journal of Neuroscience Methods*, 225(3):97–105, March 2014. URL http://dx.doi.org/10.1016/j.jneumeth.2014.01.024

J23 E. K. Roonizi and R. Sameni. Morphological modeling of cardiac signals based on signal decomposition. *Computers in Biology and Medicine*, 43(10):1453–1461, October 2013. ISSN 0010-4825. URL http://dx.doi.org/10.1016/j.compbiomed.2013.06.017

J24 F. Razavipour and R. Sameni. A General Framework for Extracting Fetal Magnetoencephalogram and Audio-Evoked Responses. *Journal of Neuroscience Methods*, 212(2):283–296, January 2013. URL http://dx.doi.org/10.1016/j.jneumeth.2012.10.021

J25 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*, 32(11):1847–1868, October 2011. URL http://dx.doi.org/10.1088/0967-3334/32/11/002

J26 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*, 205(1):47.e1–47.e5, July 2011. URL https://doi.org/10.1016/j.ajog.2011.02.066

J27 R. Sameni and G. D. Clifford. A Review of Fetal ECG Signal Processing; Issues and Promising Directions. *The Open Pacing, Electrophysiology & Therapy Journal (TOPETJ)*, 3:4–20, November 2010. URL 10.2174/1876536X01003010004

J28 G. Clifford, S. Nemati, and R. Sameni. An Artificial Vector Model for Generating Abnormal Electrocardiographic Rhythms. *Physiological Measurements*, 31(5):595–609, May 2010. URL https://dx.doi.org/10.1088/0967-3334/31/5/001

J29 R. Sameni, C. Jutten, and M. B. Shamsollahi. A deflation procedure for subspace decomposition. *Signal Processing, IEEE Transactions on*, 58(4):2363–2374, 2010b. URL https://doi.org/10.1109/TSP.2009.2037353

J30 T. Tsalaile, R. Sameni, S. Sanei, C. Jutten, and J. Chambers. Sequential Blind Source Extraction For Quasi-Periodic Signals With Time-Varying Period. *Biomedical Engineering, IEEE Transactions on*, 56(3):646–655, March 2009. URL https://doi.org/10.1109/TBME.2008.2002141

J31 R. Sameni, C. Jutten, and M. B. Shamsollahi. Multichannel Electrocardiogram Decomposition using Periodic Component Analysis. *Biomedical Engineering, IEEE Transactions on*, 55(8):1935–1940, Aug 2008a. URL https://doi.org/10.1109/TBME.2008.919714

J32 R. Sameni, M. B. Shamsollahi, and C. Jutten. Model-based Bayesian filtering of cardiac contaminants from biomedical recordings. *Physiological Measurement*, 29(5):595–613, May 2008b. URL https://doi.org/10.1088/0967-3334/29/5/006

J33 R. Sameni, M. B. Shamsollahi, C. Jutten, and G. D. Clifford. A nonlinear bayesian filtering framework for ECG denoising. *Biomedical Engineering, IEEE Transactions on*, 54(12):2172–2185, December 2007b. URL https://doi.org/10.1109/TBME.2007.897817

J34 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*, 2007:Article ID 43407, 14 pages, 2007a. URL https://doi.org/10.1155/2007/43407

Preprints & Working Papers

U1 A. Kazemnejad, P. Gordany, and R. Sameni. An open-access simultaneous electrocardiogram and phonocardiogram database. *bioRxiv*, 2021b. URL https://doi.org/10.1101/2021.05.17.444563

U2 R. Sameni. Mathematical modeling of epidemic diseases; a case study of the COVID-19 coronavirus. *arXiv preprint*, 2020b. URL https://arxiv.org/abs/2003.11371

U3 M. Rahbar Alam and R. Sameni. Automatic wake-sleep stages classification using electroencephalogram instantaneous frequency and envelope tracking. *bioRxiv*, 2020. URL http://dx.doi.org/10.1101/2020.05.13.092841

U4 R. Sameni. Spatio-Temporal Source Separation using Temporal Priors with Parameterized Uncertainties. working paper or preprint, Oct. 2016. URL https://hal.archives-ouvertes.fr/hal-01382035

U5 R. Sameni. Towards Distributed Component Analysis. working paper or preprint, Oct. 2015. URL https://hal.archives-ouvertes.fr/hal-01382076

U6 R. Sameni. Guidelines for writing efficient MATLAB codes. Technical report, Emory University, 2020a. URL https://www.overleaf.com/read/dphnzzmnrjts

Conference Papers

C1 I. Dolzhikova, B. Abibullaev, R. Sameni, and A. Zollanvari. An Ensemble CNN for Subject-Independent Classification of Motor Imagery-Based EEG. In *Engineering in Medicine and Biology Society (EMBC), 43rd Annual International Conference of the IEEE, Guadalajara, Mexico, Nov 1–5 2021*, pages 1–6. IEEE, 2021

C2 R. Sameni and C. Jutten. A Hypothesis Testing Approach to Nonstationary Source Separation. In *2021 IEEE Statistical Signal Processing Workshop (SSP), Rio de Janeiro, Brazil*. IEEE, July 2021. URL https://doi.org/10.1109/ssp49050.2021.9513811

C3 N. Katebi, R. Sameni, and G. D. Clifford. Deep sequence learning for accurate gestational age estimation from a $25 doppler device, 2020

C4 H. Narimani and R. Sameni. Electrocardiogram denoising using h-infinity filters. In *Electrical Engineering (ICEE), 2015 23rd Iranian Conference on*, May 2015. In Persian

C5 M. Samieinasab and R. Sameni. Fetal phonocardiogram extraction using single channel blind source separation. In *Electrical Engineering (ICEE), 2015 23rd Iranian Conference on*, May 2015. URL https://doi.org/10.1109/IranianCEE.2015.7146186

C6 M. Haghpanahi, R. Sameni, and D. A. Borkholder. Scoring consensus of multiple ECG annotators by optimal sequence alignment. In *Engineering in Medicine and Biology Society (EMBC), 2014 36th Annual International Conference of the IEEE*, pages 1855–1859. IEEE, 2014. URL https://doi.org/10.1109/EMBC.2014.6943971

C7 J. Behar, A. Wolfberg, T. Zhu, J. Oster, A. Niksch, D. Mah, T. Chun, J. Greenberg, C. Tanner, J. Harrop, A. V. Esbroeck, A. Alexander, M. McCarroll, T. Drake, A. Silber, R. Sameni, J. Ward, and G. Clifford. Evaluation of the fetal QT interval using non-invasive fetal ECG technology. In *American Journal of Obstetrics and Gynecology*, volume 210, pages S283–S284, New Orleans, LA, February 2014. Society for Maternal-Fetal Medicine. URL https://doi.org/10.1016/j.ajog.2013.10.609

C8 M. Fatemi, M. Niknazar, and R. Sameni. A Robust Framework for Noninvasive Extraction of Fetal Electrocardiogram Signals. In *Proceedings of the 40th Annual International Conference on Computers in Cardiology*, pages 201–204, Zaragoza, Spain, September 22-25 2013

C9 F. Razavipour, M. Haghpanahi, and R. Sameni. Fetal QRS Complex Detection using Semi-Blind Source Separation Framework. In *Proceedings of the 40th Annual International Conference on Computers in Cardiology*, pages 181–184, Zaragoza, Spain, September 22-25 2013

C10 I. Silva, J. Behar, R. Sameni, T. Zhu, J. Oster, G. D. Clifford, and G. B. Moody. Noninvasive Fetal ECG: The PhysioNet/Computing in Cardiology Challenge 2013. In *Proceedings of the 40th Annual International Conference on Computers in Cardiology*, pages 149–152, Zaragoza, Spain, September 22-25 2013

C11 M. Fatemi and R. Sameni. Application of second and higher order subspace tracking in multichannel data analysis. In *Biomedical Engineering (ICBME), 2013 20th Iranian Conference on*, pages 161–165, Dec 2013. URL http://dx.doi.org/10.1109/ICBME.2013.6782211

C12 R. Sameni. A Linear Kalman Notch Filter for Power-Line Interference Cancellation. In *Proceedings of the 16th CSI International Symposium on Artificial Intelligence and Signal Processing (AISP)*, pages 604–610, Shiraz, Iran, 2-3 May 2012 2012. URL https://doi.org/10.1109/AISP.2012.6313817

C13 H. Hassani Saadi and R. Sameni. Using matched filters for similarity search in genomic data. In *Proceedings of the 16th CSI International Symposium on Artificial Intelligence and Signal Processing (AISP)*, pages 469–472, Shiraz, Iran, 2-3 May 2012 2012. URL https://doi.org/10.1109/AISP.2012.6313793

C14 B. Vahabzadeh and R. Sameni. The Notion of Cardiac Phase and its Applications in Electrophysiological Studies. In *Biomedical Engineering (BioMed 2012)*, Innsbruck, Austria, February 15–17 2012. URL http://dx.doi.org/10.2316/P.2012.764-127

C15 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*, volume 204, pages S256–S256. Society for Maternal-Fetal Medicine, January 2011. URL http://dx.doi.org/10.1016/j.ajog.2010.10.669

C16 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*, volume 201, pages S241–S241, Chicago, IL, December 2009. Society for Maternal-Fetal Medicine. URL http://dx.doi.org/10.1016/j.ajog.2009.10.529

C17 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*, volume 201, pages S242–S242, Chicago, IL, December 2009. Society for Maternal-Fetal Medicine. URL http://dx.doi.org/10.1016/j.ajog.2009.10.535

C18 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)*, pages 419–426, Paraty, Brazil, 2009. URL https://link.springer.com/chapter/10.1007/978-3-642-00599-2_53

C19 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)*, pages 1390–1393, Antwerp, Belgium, 2008. URL https://link.springer.com/chapter/10.1007/978-3-540-89208-3_329

C20 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

C21 G. Clifford, S. Nemati, and R. Sameni. An Artificial Multi-Channel Model for Generating Abnormal Electrocardiographic Rhythms. In *Computers in Cardiology, 2008*, pages 773–776, Bologna, Italy, September 14–17 2008

C22 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

C23 O. Sayadi, R. Sameni, and M. Shamsollahi. ECG Denoising Using Parameters of ECG Dynamical Model as the States of an Extended Kalman Filter. In *Engineering in Medicine and Biology Society, 2007. EMBS 2007. 29th Annual International Conference of the IEEE*, pages 2548–2551, Aug. 2007. doi: 10.1109/IEMBS.2007.4352848. URL https://doi.org/10.1109/IEMBS.2007.4352848

C24 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*, pages 185–188, Valencia, Spain, September 17-20 2006b. URL http://cinc.mit.edu/archives/2006/

C25 C. Jutten, R. Sameni, and H. Hauksdóttir. On the Relevance of Independent Components. In *Proc. of the ICA Research Network International Workshop (ICArn 2006)*, pages 1–8, Liverpool, UK, September 18-19 2006

C26 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)*, pages 656–661, Vancouver, Canada, August 2006a. URL https://doi.org/10.1109/ISSPIT.2006.270882

C27 R. Sameni, F. Vrins, F. Parmentier, C. Hérail, 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)*, volume 872, pages 97–104, CNRS, Paris, France, July 8-13 2006c. URL http://hdl.handle.net/2078.1/90753

C28 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*, pages 1017–1020, Lyon, France, September 25-28 2005b

C29 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)*, pages 5639–5642, Shanghai, China, September 1-4 2005a. URL https://doi.org/10.1109/IEMBS.2005.1615765

C30 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)*, pages 193–196, Innsbruck, Austria, February 2004

C31 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

Open-Source Projects and Public Datasets

O1 GitHub Repository: https://github.com/rsameni

O2 Alphanumerics Lab: https://github.com/alphanumericslab

O3 R. Sameni. *The Open-Source Electrophysiological Toolbox (OSET), version 3.14*, 2018. URL http://www.oset.ir

O4 Open-access data: A. Kazemnejad, P. Gordany, and R. Sameni. EPHNOGRAM: A Simultaneous Electrocardiogram and Phonocardiogram Database, 2021a. URL https://physionet.org/content/ephnogram/1.0.0/

O5 Open-access data: R. Sameni and M. Samieinasab. Shiraz University Fetal Heart Sounds Database, 2021. URL https://physionet.org/content/sufhsdb/1.0.1/

O6 D. Pani, E. Sulas, M. Urru, R. Sameni, L. Raffo, and R. Tumbarello. NInFEA: Non-Invasive Multimodal Foetal ECG-Doppler Dataset for Antenatal Cardiology Research, 2020. URL https://physionet.org/content/ninfea/1.0.0/

O7 Pandemic prediction and control models and codes: https://github.com/alphanumericslab/EpidemicModeling.git

Supervised Theses

PhD

P1 N. Katebi. *Detection of adverse events in pregnancy using a low cost 1D Doppler ultrasound signal*. PhD thesis, Department of Biomedical Informatics, Emory University, 2021. [Due date: 2021], Co-supervised with Dr. Gari Clifford

P2 F. Jamshidian-Tehrani. *Online Noninvasive Fetal Cardiac Signal Extraction*. PhD thesis, Artificial Intelligence, School of Electrical & Computer Engineering, Shiraz University, September 2019. Supervised by: Dr. Reza Sameni

P3 D. Fattahi. *A Statistical Framework for Cardiac Parameter Estimation*. PhD thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 2017. [Due date: 2021], Supervised by: Dr. Reza Sameni

Masters

M1 N. Kheram. Modeling and Denoising of Phonocardiogram Signals. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 9 2019. Supervised by: Dr. Reza Sameni

M2 M. Maghsoudi. Tracking and Estimating Biological Branching Structures. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 9 2019. Supervised by: Dr. Reza Sameni

M3 A. Kazemnejad. Analysis of Synchronous Electrocardiogram and Phonocardiogram Parameters Extracted from Normal Subjects. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, September 2018. Supervised by: Dr. Reza Sameni

M4 N. Firoozi. A Hardware Architecture for Efficient Implementation of Elementary Functions. Master's thesis, Computer Architecture, School of Electrical & Computer Engineering, Shiraz University, 9 2018. Supervised by: Dr. Reza Sameni

M5 S. Keshavarzi. Designing a Hardware Architecture for the Implementation of Online Subspace Tracking Algorithms. Master's thesis, Computer Architecture, School of Electrical & Computer Engineering, Shiraz University, 9 2018. Supervised by: Dr. Reza Sameni

M6 M.-A. Abbasi. Design and Implementation of Parametric RTL Tools for Linear Algebraic Calculations. Master's thesis, Computer Architecture, School of Electrical & Computer Engineering, Shiraz University, 2 2018. Supervised by: Dr. Reza Sameni

M7 P. Torabi. Implementation of Artificial Neural Networks on FPGA with Scalable and parametric Design. Master's thesis, Computer Architecture, School of Electrical & Computer Engineering, Shiraz University, February 2018. Supervised by: Dr. Reza Sameni

M8 L. Akbari. Random Circuit Generation for Evaluation of Different Levels of Synthesis and Implementation of Reconfigurable Circuits. Master's thesis, Computer Architecture, School of Electrical & Computer Engineering, Shiraz University, 9 2017. Supervised by: Dr. Reza Sameni

M9 M. Rahbaralam. Evaluation of Instantaneous Frequency Estimation Techniques with Application in Electroencephalogram Analysis. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 5 2017. Supervised by: Dr. Reza Sameni

M10 R. Mohammadzadeh. Implementation of Blind Source Separation and Frequency Scrambling Algorithms on FPGA Soft-Cores Using Mixed-Design. Master's thesis, Computer Architecture, School of Electrical & Computer Engineering, Shiraz University, 9 2016. Supervised by: Dr. Reza Sameni

M11 E. Seraj. A Comparison of Cerebral Signal Phase Extraction and Analysis Methods. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, September 2016. Supervised by: Dr. Reza Sameni

M12 S. Doostkam. Design and Implementation of a Portable Assistive System for Visually Impared People. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 9 2016. Supervised by: Dr. Reza Sameni

M13 H. Biglari. Fetal Motion Tracking from Non-Invasive Cardiac Signal Recordings. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 2015. Supervised by: Dr. Reza Sameni

M14 Z. Sadeghian. Analysis and Prediction of Economic Indexes using Signal Processing Techniques. Master's thesis, Artificial Intelligence, School of Electrical & Computer Engineering, Shiraz University, 10 2015. Supervised by: Dr. Reza Sameni

M15 M. Samieinasab. Modeling and Filtering of Fetal Phonocardiogram Signals. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, February 2015. Supervised by: Dr. Reza Sameni

M16 H. Narimani. Application of Kalman and H-infinity Filters in Electrocardiogram Denoising. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 9 2014. Supervised by: Dr. Reza Sameni

M17 B. Tavakol-Shoorjeh. Distributed Component Analysis and its Applications in Biosignal Processing. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, September 2014. Supervised by: Dr. Reza Sameni

M18 Z. Kheradpisheh. Comparison of Linear and Nonlinear Electrocardiogram Processing Techniques. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 2 2014. Supervised by: Dr. Reza Sameni

M19 M. Fatemi. Application of Subspace Tracking Techniques for Fetal Cardiac Signal Extraction. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 3 2013. Supervised by: Dr. Reza Sameni

M20 H. Hassani-Saadi. Application of Signal Processing Algorithms for Non-numeric Data. Master's thesis, Artificial Intelligence, School of Electrical & Computer Engineering, Shiraz University, 3 2013. Supervised by: Dr. Reza Sameni

M21 F. Razavipour. Fetal Magnetoencephalogram Extraction and Phase Analysis of the Electroencephalogram. Master's thesis, Artificial Intelligence, School of Electrical & Computer Engineering, Shiraz University, 3 2012. Supervised by: Dr. Reza Sameni

M22 B. Vahabzadeh. Study of Heart Rate Calculation Techniques and the Notion of Cardiac Signal Phase. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, February 2012. Supervised by: Dr. Reza Sameni

M23 S. Niknam. Multichannel Cardiac Signal Processing & Sensor Selection Techniques. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 1 2012. Supervised by: Dr. Reza Sameni

M24 E. Kheirati-Roonizi. Morphological Modeling of Cardiac Signals. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Shiraz University, 6 2011. Supervised by: Dr. Reza Sameni

M25 S. Kharabian. Fetal R-Wave Detection from Non-Invasive Magnetocardiogram Recordings. Master's thesis, Biomedical Engineering, School of Electrical & Computer Engineering, Sharif University of Technology, 9 2009. Jointly Supervised by: Dr. Mohammad-Bagher Shamsollahi and Dr. Reza Sameni

Reviews

- Associate Editor of the IET Healthcare Technology Letters, since 2020
- Editorial Board member of the International Journal of Science & Technology (Scientia Iranica), since 2019
- Journal & conference reviews: Publons
- Was awarded the Outstanding Reviewer Award of Physiological Measurement in 2018

INDUSTRIAL & ENGINEERING

Programming Languages

C, C++, Matlab/Octave, Verilog (HDL).

Companies and Research Centers

- Founder and CEO of Alphanumériques®, Data and Signal Analysis Solutions, Grenoble, France. *2019–2020*
- Technology adviser and algorithm developer, MindChild Medical, Inc., North Andover, MA, USA. *2008–2012, 2019–2020*
- Technology adviser, Vala-Andishe Paya (VAP) Ltd., Shiraz, Iran. *2017–2020*
- Founder and director, Signal Processing Center (SPC), Shiraz University, Shiraz, Iran. *2010–2015*
- Co-founder, Software Defined Radio Center (SDRC), Shiraz University, Shiraz, Iran. *2013–2016*
- Senior Signal Processing Engineer, Basamad Negar Ltd., Tehran, Iran. *2001–2005*
- Electronics Engineer, Iranian Research Organization for Science & Technology (IROST), Tehran, Iran. *2000–2001*

ADMINISTRATION & SERVICE

- Associate Editor, Healthcare Technology Letters, Since Aug 2020
- Chair of the Department of Computer Science & Engineering & IT, Shiraz University, 2016–2018.
- Vice-Dean of Student Affairs, School of Electrical & Computer Engineering, Shiraz University, 2009–2015.
- Shiraz University's International Office Representative for collaboration with universities of France, 2017.
- Member of the course planning committee, Shiraz University, 2016–2018.
- Member of Fars Province Science and Technology Park Consulting Committee and Evaluation Board, 2016–2017.
- External Referee, Iran's National Cognitive Sciences and Technologies Council, 2010–2014.
- External Referee, Iran's National Elites Foundation (Fars branch), 2010–2014.
- Co-founder of the MSc and PhD programs of Bioelectrical Engineering in Shiraz University
- Co-founder of the MSc program of Computer Architecture in Shiraz University

MEMBERSHIPS

- Senior Member of the Institute of Electrical and Electronics Engineering (IEEE); (Student Member 2001, Member 2008, Senior Member 2015)
- Member of Iran's National Elites Foundation, 2010–2019

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