

EUROPEAN CURRICULUM VITAE FORMAT



Last updated: February 4th, 2019

PERSONAL INFORMATION

Name
Address
Telephone
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E-mail

Nationality

Date of birth

RICCARDO BARBIERI
VIA PONZIO 34/5, 20133 MILANO
+39 02 2399 3372

riccardo.barbieri@polimi.it

Italian

03/01/1967



WORK EXPERIENCE

- Dates (from – to)
- Name and address of employer
 - Type of business or sector
 - Occupation or position held
- Main activities and responsibilities

2015 – present
Politecnico di Milano
Department of Electronics, Informatics and Bioengineering
Associate Professor
Academic Position

- Dates (from – to)
- Name and address of employer
 - Type of business or sector
 - Occupation or position held
- Main activities and responsibilities

2015 – present
Massachusetts General Hospital
Dept. of Anesthesia, Critical Care and Pain Medicine
Visiting Biomedical Engineer

- Dates (from – to)
- Name and address of employer
 - Type of business or sector
 - Occupation or position held
- Main activities and responsibilities

2006 – present
Massachusetts Institute of Technology
Dept. of Brain and Cognitive Sciences
Visiting Research Faculty

- Dates (from – to)
- Name and address of employer
 - Type of business or sector
 - Occupation or position held
- Main activities and responsibilities

2007 – 2015
Harvard Medical School
Dept. of Anesthesia, Critical Care and Pain Medicine
Assistant Professor
Academic Position

- Dates (from – to)
- Name and address of employer
 - Type of business or sector
 - Occupation or position held
- Main activities and responsibilities

2000 – 2015
Massachusetts General Hospital
Dept. of Anesthesia, Critical Care and Pain Medicine
Assistant Biomedical Engineer

- Dates (from – to)

2000 – 2007

- Name and address of employer
 - Type of business or sector
 - Occupation or position held
- Main activities and responsibilities
 - Dates (from – to)
- Name and address of employer
 - Type of business or sector
 - Occupation or position held
- Main activities and responsibilities
 - Dates (from – to)
- Name and address of employer
 - Type of business or sector
 - Occupation or position held
- Main activities and responsibilities

Harvard Medical School
Dept. of Anesthesia, Critical Care and Pain Medicine

Instructor
Academic Position

1998 – 2000
Massachusetts General Hospital
Dept. of Anesthesia, Critical Care and Pain Medicine
Research Assistant
Postdoctoral Position

1997 – 2000
Harvard Medical School
Dept. of Anesthesia, Critical Care and Pain Medicine
Research Fellow
Postdoctoral Position

EDUCATION AND TRAINING

- Dates (from – to)
- Name and type of organization providing education and training
- Principal subjects/occupational skills covered
 - Title of qualification awarded
- Level in national classification (if appropriate)

1993 – 1998
Boston University, Boston, MA, USA

Biomedical Engineering

PhD

- Dates (from – to)
- Name and type of organization providing education and training
- Principal subjects/occupational skills covered
 - Title of qualification awarded
- Level in national classification (if appropriate)

1993 – 1998
Universita' degli Studi di Roma "La Sapienza", Roma, Italy

Electrical Engineering

MS (Laurea)
110/110

PERSONAL SKILLS AND COMPETENCES

Acquired in the course of life and career but not necessarily covered by formal certificates and diplomas.

MOTHER TONGUE

ITALIAN

OTHER LANGUAGES

- Reading skills
- Writing skills
- Verbal skills

ENGLISH
excellent
excellent
excellent

TEACHING SKILLS
AND COMPETENCES
Courses

1993	Introduction to Biomedical Engineering (EK-130), Undergraduate Teaching Assistant Approximately 50 1 st year undergraduate students	Boston University, Boston, MA 20 hours per wk.
1994-2014	“Digital Signal Processing applied to Neural and Cardiovascular Signals”, Lecturer Approximately 20 graduate and undergraduate students per year	
2015 -	Bioengineering of Neurosensory Systems, Approximately 220 1 st year master students	Politecnico di Milano, Milano, Italy 5 hours per wk.
2016 -	Advanced Signals and Data Processing in Medicine Approximately 50 1 st /2 nd year master students	Politecnico di Milano, Milano, Italy 8 hours per wk.

RESEARCH SKILLS
AND COMPETENCES
Selected Publications

H-INDEX: 28
CITED DOCUMENTS:177
TOTAL CITATIONS:2684

- **Barbieri R**, Waldmann RA, Di Virgilio V, Tiedman JK, Bianchi AM, Cerutti S, Saul JP. Continuous quantification of baroreflex and respiratory control of heart rate by use of bivariate autoregressive techniques. *Annals of Noninvasive Electrocardiology*; 3:264-77, 1996.
- Di Virgilio V, **Barbieri R**, Mainardi LT, Strano S, Cerutti S. A multivariate time-variant AR method for the analysis of heart rate and arterial blood pressure. *Med Eng Phys*. 1997 Mar;19(2):109-24. PubMed PMID: 9203145.
- Mainardi LT, Bianchi AM, Furlan R, Piazza S, **Barbieri R**, Di Virgilio V, Malliani A, Cerutti S. Multivariate time-variant identification of cardiovascular variability signals: a beat-to-beat spectral parameter estimation in vasovagal syncope. *IEEE Trans Biomed Eng*. 1997 Oct;44(10):978-89. PubMed PMID: 9311167.
- **Barbieri R**, Bianchi AM, Tiedman JK, Mainardi LT, Cerutti S, Saul JP. Model dependency of multivariate autoregressive spectral analysis: quantifying cardiovascular control using bivariate and trivariate models. *IEEE Eng Med Biol Mag*. 1997 Sep-Oct;16(5):74-85. PubMed PMID: 9313084.
- **Barbieri R**, Quirk MC, Frank LM, Wilson MA, Brown EN. A time-dependent analysis of spatial information encoding in the rat hippocampus. *Neurocomputing* 2000;32-33:629-635.
- **Barbieri R**, Quirk MC, Frank LM, Wilson MA, Brown EN. Construction and analysis of non-Poisson stimulus-response models of neural spike train activity. *J Neurosci Methods*. 2001 Jan 30;105(1):25-37. PubMed PMID: 11166363.
- **Barbieri R**, Quirk MC, Frank LM, Wilson MA, Brown EN. Diagnostic methods for statistical models of place cell spiking activity. *Neurocomputing* 2001;38:1087-1093.
- **Barbieri R**, Frank LM, Quirk MC, Solo V, Wilson MA, Brown EN. Construction and analysis of non-gaussian place field models of neural spiking activity. *Neurocomputing*; 44-46:309-314, 2002.
- **Barbieri R**, Parati G, Saul JP. Closed vs. open loop assessment of the heart rate baroreflex. *IEEE Eng Med Biol Mag*. 2001 Mar-Apr;20(2):33-42. PubMed PMID: 11321718.
- Brown EN, **Barbieri R**, Ventura V, Kass RE, Frank LM. The time-rescaling theorem and its application to neural spike train data analysis. *Neural Comput*. 2002 Feb;14(2):325-46. PubMed PMID: 11802915
- **Barbieri R**, Tiedman JK, Saul JP. Heart rate control and mechanical cardiopulmonary coupling to assess central volume: a systems analysis. *Am J Physiol Regul Integr Comp Physiol*. 2002 Nov;283(5):R1210-20. PubMed PMID: 12376415.
- **Barbieri R**, Frank LM, Nguyen DP, Quirk MC, Solo V, Wilson MA, Brown EN. Dynamic analyses of information encoding in neural ensembles. *Neural Comput*. 2004 Feb;16(2):277-307. PubMed PMID: 15006097.
- Eden UT, Frank LM, **Barbieri R**, Solo V, Brown EN. Dynamic analysis of neural encoding by point process adaptive filtering. *Neural Comput*. 2004 May;16(5):971-98. PubMed PMID: 15070506.
- **Barbieri R**, Matten EC, Alabi AA, Brown EN. A point process model of human heart rate intervals: new definitions of heart rate and heart rate variability. *Am J Physiol Heart Circ Physiol*.

2005 Jan;288(1):H424-35. Epub 2004 Sep 16. PubMed PMID: 15374824.

- Carrington MJ, **Barbieri R**, Colrain IM, Crowley KE, Kim Y, Trinder J. Changes in cardiovascular function during the sleep onset period in young adults. *J Appl Physiol*. 2005 Feb;98(2):468-76. Epub 2004 Sep 24. PubMed PMID: 15448124.
- **Barbieri R**, Frank LM, Wilson MA, Brown EN. An analysis of hippocampal spatio-temporal representations using a Bayesian algorithm for neural spike train decoding. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. 2005 Jun;13(2):131-6. PubMed PMID: 16003890.
- **Barbieri R**, Brown EN. Analysis of heart dynamics by point process adaptive filtering. *IEEE Trans Biomed Eng*. 2006 Jan;53(1):4-12. PubMed PMID:16402597.
- Ergún A, **Barbieri R**, Eden UT, Wilson MA, Brown EN. Construction of point process adaptive filter algorithms for neural systems using sequential Monte Carlo methods. *IEEE Trans Biomed Eng*. 2007 Mar;54(3):419-28. PubMed PMID:17355053.
- Wyller VB, **Barbieri R**, Thaulow E, Saul JP. Enhanced vagal withdrawal during mild orthostatic stress in adolescents with chronic fatigue. *Ann Noninvasive Electrocardiol*. 2008 Jan;13(1):67-73. PubMed PMID: 18234008.
- **Barbieri R**, Brown EN. Application of dynamic point process models to cardiovascular control. *Biosystems*. 2008 Jul-Aug;93(1-2):120-5. Epub 2008 Apr 26. PubMed PMID: 18515000; PubMed Central PMCID: PMC2561955.
- Napadow V, Dhond R, Conti G, Makris N, Brown EN, **Barbieri R**. Brain correlates of autonomic modulation: combining heart rate variability with fMRI. *Neuroimage*. 2008 Aug 1;42(1):169-77. Epub 2008 Apr 30. PubMed PMID: 18524629; PubMed Central PMCID: PMC2603289.
- Wyller VB, Saul JP, **Barbieri R**, de Lange C, Hopp E, Norum IB, Thaulow E. Autonomic heart rate control at rest and during unloading of the right ventricle in repaired tetralogy of Fallot in adolescents. *Am J Cardiol*. 2008 Oct 15;102(8):1085-9. Epub 2008 Jul 31. PubMed PMID: 18929714; PubMed Central PMCID: PMC2645862.
- Chen Z, Brown E, **Barbieri R**. Assessment of autonomic control and respiratory sinus arrhythmia using point process models of human heart beat dynamics. *IEEE Trans Biomed Eng*. 2009 Jul;56(7):1791-802. Epub 2009 Mar 4. PubMed PMID: 19272971. PubMed Central PMCID: PMC2804879.
- Chen Z, Vijayan S, **Barbieri R**, Wilson MA, Brown EN. Discrete- and continuous-time probabilistic models and algorithms for inferring neuronal UP and DOWN states. *Neural Comput*. 2009 Jul;21(7):1797-1862. Epub Mar 26. PubMed PMID:19323637. PubMed Central PMCID: PMC2799196.
- Nguyen DP, Kloosterman F, **Barbieri R**, Brown EN, Wilson MA. Characterizing the dynamic frequency structure of fast oscillations in the rodent hippocampus. *Front Integr Neurosci*. 2009;3:11. Epub 2009 Jun 10. PubMed PMID: 19562084. PubMed Central PMCID: PMC2701674
- Nguyen DP, Wilson MA, Brown EN, **Barbieri R**. Measuring instantaneous frequency of local field potential oscillations using the Kalman smoother. *J Neurosci Methods* 2009 Nov 15;184(2):365-74. Epub 2009 Aug 21. PubMed PMID: 19699763. PubMed Central PMCID: PMC2767386.
- Chen Z, Brown E, **Barbieri R**. Characterizing nonlinear heartbeat dynamics within a point process framework. *IEEE Trans Biomed Eng*. 2010 Jun;57(6):1335-47. Epub 2010 Feb 17. PubMed PMID: 20172783. PubMed Central PMCID: **PMC2952361**.
- Chen Z, Putrino D, Ghosh S, **Barbieri R**, Brown E. Statistical inference for assessing functional connectivity of neuronal ensembles with sparse spiking data. *IEEE Trans Neural Syst Rehabil Eng*. 2011 Apr;19(2):121-35. Epub 2010 Oct 11. PubMed PMID: 20937583; PubMed Central PMCID: PMC3044782.
- Chen Z, Purdon PL, Harrell G, Pierce ET, Walsh J, Brown EN, **Barbieri R**. Dynamic assessment of baroreflex control of heart rate during induction of propofol anesthesia using a point process method. *Ann Biomed Eng*. 2011 Jan;39(1):260-76. Epub 2010 Oct 13. PubMed PMID: 20945159. PubMed Central PMCID: PMC3010293.
- Wyller VB, **Barbieri R**, Saul JP. Blood pressure variability and closed-loop baroreflex assessment in adolescent chronic fatigue syndrome during supine rest and orthostatic stress.

Eur J Appl Physiol. 2011 Mar;111(3):497-507. Epub 2010 Oct 2. PubMed PMID: 20890710. PubMed Central PMCID: PMC3037975.

- LaCount LT, **Barbieri R**, Park K, Kim J, Brown EN, Kuo B, Napadow V. Static and dynamic autonomic response with increasing nausea perception. *Aviat Space Environ Med.* 2011 Apr; 82(4): 424-33. PubMed PMID: 21485400. PubMed Central PMCID: PMC3137518.
- Indic P, Bloch-Salisbury E, Bednarek F, Brown EN, Paydarfar D, **Barbieri R**. Assessment of cardio-respiratory interactions in preterm infants by bivariate autoregressive modeling and surrogate data analysis. *Early Hum Dev.* 2011 Jul;87(7):477-87. doi: 10.1016/j.earlhumdev.2011.04.001. Epub 2011 Apr 20. PubMed PMID: 21511413. PubMed Central PMCID: PMC3114161.
- Kodituwakku S, Lazar SW, Indic P, Chen Z, Brown EN, **Barbieri R**. Point process time-frequency analysis of dynamic respiratory patterns during meditation practice. *Med Biol Eng Comput.* 2012 Mar;50(3):261-75. Epub 2012 Feb 21. DOI: 10.1007/s11517-012-0866-z. PubMed PMID: 22350435. PubMed Central PMCID: PMC3341131.
- Chen Z, Purdon PL, Brown EN, **Barbieri R**. A Unified point process probabilistic framework to assess heartbeat dynamics and autonomic cardiovascular control. *Frontiers in Computational Physiology and Medicine.* 2012; DOI: 10.3389/fphys.2012.00004. PMID:22375120. PMCID: PMC3269663.
- Citi L, Brown EN, **Barbieri R**. A real-time automated point-process method for the detection and correction of erroneous and ectopic heartbeats. *IEEE Trans Biomed Eng.* 2012 Oct;59(10):2828-37. Epub 2012 Aug 2. PubMed PMID: 22875239; PubMed Central PMCID: PMC3523127.
- Orini M, Bailon R, Laguna P, Mainardi LT, **Barbieri R**. *EURASIP Journal on Advances in Signal Processing* 2012, 2012:214. <http://asp.eurasipjournals.com/content/2012/1/214>. doi:10.1186/1687-6180-2012-214.
- Napadow V, Lee J, Kim J, Cina S, Maeda Y, **Barbieri R**, Harris RE, Kettner N, Park K. Brain correlates of phasic autonomic response to acupuncture stimulation: An event-related fMRI study. *Hum Brain Mapp.* 2013 Oct;34(10):2592-606. doi: 10.1002/hbm.22091. Epub 2012 Apr 14. PubMed PMID: 22504841. PMCID: PMC3646924.
- Indic P, Paydarfar D, **Barbieri R**. Point process modeling of inter-breath interval: a new approach for the assessment of instability of breathing in neonates. *IEEE Trans Biomed Eng.* 2013 Oct;60(10):2858-66. doi: 10.1109/TBME.2013.2264162. Epub 2013 May 31. PMID: 23739777.
- Valenza G, Citi L, Scilingo EP, **Barbieri R**. Point-process nonlinear models with Laguerre and Volterra expansions: instantaneous assessment of heartbeat dynamics. *IEEE Transactions on Signal Processing* 2013. 61(11).
- Onorati F, **Barbieri R**, Mauri M, Russo V, Mainardi L. Characterization of affective states by pupillary dynamics and autonomic correlates. *Front Neuroeng.* 2013 Nov 6;6:9. doi: 10.3389/fneng.2013.00009. PubMed PMID:24223553; PubMed Central PMCID: PMC3818468.
- Citi L, Ba D, Brown EN, **Barbieri R**. Likelihood Methods for Point Processes with Refractoriness. *Neural Computation.* 2014 Feb;26(2):237-63. doi: 10.1162/NECO_a_00548. Epub 2013 Nov 8. PMID: 24206384.
- Valenza G, Citi L, Lanata' A, Scilingo EP, **Barbieri R**. Revealing real-time emotional responses: A personalized assessment based on heartbeat dynamics. *Nature: Sci Rep.* 2014 May 21;4:4998. doi: 10.1038/srep04998. PMID: 24845973. PMCID: PMC4028901.
- Valenza G, Citi L, Gentili C, Lanata' A, Scilingo EP, **Barbieri R**. Point-process Nonlinear Autonomic Assessment of Depressive States in Bipolar Patients. *Methods Inf Med.* 2014 Aug 11;53(4):296-302. doi: 10.3414/ME13-02-0036. Epub 2014 Jun 27. PMID: 24970591
- Sclocco R, Kim J, Garcia RG, Sheehan JD, Beissner F, Bianchi AM, Cerutti S, Napadow V, **Barbieri R**. Brain Circuitry Supporting Multi-Organ Autonomic Outflow in Response to Nausea. *Cerebral Cortex* 2014; doi: 10.1093/cercor/bhu172. PMID: 25115821.
- Valenza G, Citi L, **Barbieri R**. Estimation of Instantaneous Complex Dynamics through Lyapunov Exponents: A Study on Heartbeat Dynamics. *PLoS One.* 2014 Aug 29;9(8):e105622. doi: 10.1371/journal.pone.0105622. e. PMID: 25170911. PMCID: PMC4149483.
- Valenza G, Citi L, Scilingo EP, **Barbieri R**. Inhomogeneous point-process entropy: An

instantaneous measure of complexity in discrete systems. *Physical Review E* 2014 May 9; 89, 052803. DOI: <http://dx.doi.org/10.1103/PhysRevE.89.052803>. PMID: 25353840.

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- Valenza G, Citi L, Gentili C, Lanata' A, Scilingo EP, **Barbieri R**. Characterization of Depressive States in Bipolar Patients using Wearable Textile Technology and Instantaneous Heart Rate Variability Assessment. *IEEE Journal of Biomedical and Health Informatics*. 2015 Jan;19(1):263-74. doi: 10.1109/JBHI.2014.2307584. PMID: 25561449.
- Valenza G, Garcia R, Citi L, Scilingo EP, Tomaz C, Barbieri R. Nonlinear digital signal processing in mental health: characterization of major depression using instantaneous entropy measures of heartbeat dynamics. *Front. Physiol.*, 13 March 2015 | doi: 10.3389/fphys.2015.00074
- Kim J, Loggia ML, Cahalan CM, Harris RE, Beissner F, Garcia RG, Kim H, **Barbieri R**, Wasan AD, Edwards RR, Napadow V. The somatosensory link in fibromyalgia: functional connectivity of the primary somatosensory cortex is altered by sustained pain and is associated with clinical/autonomic dysfunction. *Arthritis Rheumatol*. 2015 May;67(5):1395-405. doi: 10.1002/art.39043. PMID: 25622796.
- Garcia RG, Valenza G, Tomaz C, **Barbieri R**. Relationship between cardiac vagal activity and mood congruent memory bias in major depression. *J Affect Disord*. 2016 Jan 15;190:19-25. doi: 10.1016/j.jad.2015.09.075. (Epub 2015 Oct 13). PMID: 26480207.
- Sclocco, R., Kim, J., Garcia, R.G., Sheehan, J.D., Beissner, F., Bianchi, A.M., Cerutti, S., Kuo, B., Barbieri, R., Napadow, V. Brain Circuitry Supporting Multi-Organ Autonomic Outflow in Response to Nausea. *Cerebral Cortex*, 2016 26 (2), pp. 485-497. DOI: 10.1093/cercor/bhu172
- Onorati, F., Mainardi, L.T., Sirca, F., Russo, V., **Barbieri, R**. Nonlinear analysis of pupillary dynamics. *Biomedizinische Technik*, 2016 61 (1), pp. 95-106. DOI: 10.1515/bmt-2015-0027. (Epub 2015 Aug 6. pii: /j/bmte.ahead-of-print/bmt-2015-0027/bmt-2015-0027.xml.). PMID: 26351899.
- Duggento, A., Bianciardi, M., Passamonti, L., Wald, L.L., Guerrisi, M., **Barbieri, R.**, Toschi, N. Globally conditioned Granger causality in brain-brain and brain-heart interactions: A combined heart rate variability/ultra-high-field (7 T) functional magnetic resonance imaging study. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*. 2016 374 (2067), DOI: 10.1098/rsta.2015.0185. PMID: 27044985.
- Valenza, G., Toschi, N., **Barbieri, R**. Uncovering brain-heart information through advanced signal and image processing. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*. 2016 374 (2067), DOI: 10.1098/rsta.2016.0020. PMID: 27044995. PMCID: PMC4822450.
- Sclocco, R., Beissner, F., Desbordes, G., Polimeni, J.R., Wald, L.L., Kettner, N.W., Kim, J., Garcia, R.G., Renvall, V., Bianchi, A.M., Cerutti, S., Napadow, V., **Barbieri, R**. Neuroimaging brainstem circuitry supporting cardiovagal response to pain: A combined heart rate variability/ultra-high-field (7 T) functional magnetic resonance imaging study. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*. 2016 374 (2067), DOI: 10.1098/rsta.2015.0189. PMID: 27044996.
- Valenza, G., Orsolini, S., Diciotti, S., Citi, L., Scilingo, E.P., Guerrisi, M., Danti, S., Lucetti, C., Tessa, C., **Barbieri, R.***, Toschi, N*. Assessment of spontaneous cardiovascular oscillations in Parkinson's disease. *Biomedical Signal Processing and Control*, 2016 26, pp. 80-89. DOI: 10.1016/j.bspc.2015.12.001
- Valenza, G., Greco, A., Citi, L., Bianchi, M., **Barbieri, R.**, Scilingo, E.P. Inhomogeneous Point-Processes to Instantaneously Assess Affective Haptic Perception through Heartbeat Dynamics Information. *Scientific Reports*, 2016, 6, art. no. 28567
- Tacchino G, Gandolla M, Coelli S, **Barbieri R**, Pedrocchi A, Bianchi AM. EEG Analysis During Active and Assisted Repetitive Movements: Evidence for Differences in Neural Engagement. *IEEE Trans Neural Syst Rehabil Eng*. 2016 Aug 2. [Epub ahead of print] PMID: 27529874
- Gee AH, **Barbieri R**, Paydarfar D, Indic P. Predicting Bradycardia in Preterm Infants Using Point Process Analysis of Heart Rate. *IEEE Trans Biomed Eng*. 2016 Nov 24. [Epub ahead of print] PMID: 27898379

- Toschi N, Kim J, Sclocco R, Duggento A, **Barbieri R**, Kuo B, Napadow V. Motion sickness increases functional connectivity between visual motion and nausea-associated brain regions. *Auton Neurosci*. 2017 Jan;202:108-113. doi: 10.1016/j.autneu.2016.10.003. Epub 2016 Oct 17. PMID: 28245927
- Valenza G, Citi L, Garcia RG, Taylor JN, Toschi N, **Barbieri R**. Complexity Variability Assessment of Nonlinear Time-Varying Cardiovascular Control. *Sci Rep*. 2017 Feb 20;7:42779. doi: 10.1038/srep42779. PMID: 28218249
- Nagaraj SB, Biswal S, Boyle EJ, Zhou DW, McClain LM, Bajwa EK, Quraishi SA, Akeju O, **Barbieri R**, Purdon PL, Westover MB. Patient-Specific Classification of ICU Sedation Levels From Heart Rate Variability. *Crit Care Med*. 2017 Jul;45(7):e683-e690. doi: 10.1097/CCM.0000000000002364. PMID: 28441231
- Garcia RG, Lin RL, Lee J, Kim J, **Barbieri R**, Sclocco R, Wasan AD, Edwards RR, Rosen BR, Hadjikhani N, Napadow V. Modulation of brainstem activity and connectivity by respiratory-gated auricular vagal afferent nerve stimulation in migraine patients. *Pain*. 2017 Aug;158(8):1461-1472. doi: 10.1097/j.pain.0000000000000930. PMID: 28541256
- Valenza G, Faes L, Citi L, Orini M, **Barbieri R**. Instantaneous Transfer Entropy for the Study of Cardiovascular and Cardio-Respiratory Nonstationary Dynamics. *IEEE Trans Biomed Eng*. 2017 Aug 15. doi: 10.1109/TBME.2017.2740259. [Epub ahead of print] PMID:28816654
- Coelli S, **Barbieri R**, Reni G, Zucca C, Bianchi AM. EEG indices correlate with sustained attention performance in patients affected by diffuse axonal injury. *Med Biol Eng Comput*. 2017 Nov 9. doi: 10.1007/s11517-017-1744-5. [Epub ahead of print] PMID:29124529
- Valenza G, Citi L, Saul JP, **Barbieri R**. Measures of Sympathetic and Parasympathetic Autonomic Outflow from Heartbeat Dynamics. *J Appl Physiol (1985)*. 2018 Feb 15. doi: 10.1152/jappphysiol.00842.2017. [Epub ahead of print] PMID: 29446712
- Duggento A, Passamonti L, Valenza G, **Barbieri R**, Guerrisi M, Toschi N. Multivariate Granger causality unveils directed parietal to prefrontal cortex connectivity during task-free MRI. *Sci Rep*. 2018 Apr 3;8(1):5571. doi: 10.1038/s41598-018-23996-x. PMID: 29615790
- Valenza G, Iozzia L, Cerina L, Mainardi L, **Barbieri R**. Analysis of Instantaneous Linear, Nonlinear and Complex Cardiovascular Dynamics from Videophotoplethysmography. *Methods Inf Med*. 2018 May;57(3):135-140. doi: 10.3414/ME17-02-0013. Epub 2018 May 2. PMID:29719921
- Valenza G, Wendt H, Kiyono K, Hayano J, Watanabe E, Yamamoto Y, Abry P, **Barbieri R**. Mortality Prediction in Severe Congestive Heart Failure Patients with Multifractal Point-Process Modeling of Heartbeat Dynamics. *IEEE Trans Biomed Eng*. 2018 Jan 23. doi: 10.1109/TBME.2018.2797158. [Epub ahead of print]. PMID: 29993522
- Tessa C, Toschi N, Orsolini S, Valenza G, Lucetti C, **Barbieri R**, Diciotti S. Central modulation of parasympathetic outflow is impaired in de novo Parkinson's disease patients. *PLoS One*. 2019 Jan 17;14(1):e0210324. doi: 10.1371/journal.pone.0210324. eCollection 2019. PMID: 30653564

ORGANIZATIONAL SKILLS AND COMPETENCES

Coordination and administration of people, projects and budgets.

Funded Projects (research Grants):

2018-2019, MIT-Italy MISTI Grant
Principal Investigators : Riccardo Barbieri (POLIMI) and Pawan Sinha (MIT)
“ Sensory Habituation in Autism Spectrum Disorders”
USD 15,000.

2017-2018, MIT-Italy MISTI Grant
Principal Investigators : Riccardo Barbieri (POLIMI) and Roger Mark (MIT)
“ Characterizing Hypotensive Episodes in the Intensive Care Unit”
USD 15,000.

2016-2018, American Heart Association
Principal Investigator, Grant: “Grant-in-Aid Award”
“Effects of Transcutaneous Nerve Stimulation on Hypertension”
USD 198,000.

2015-2017, University of Rome “Tor Vergata”

Co-Principal Investigator, Grant: "Joint Chairs 2014"

"Joint dynamical Heart Rate Variability and resting state fMRI analysis: a new tool to investigate central correlates of ANS dysfunction in Parkinson's Disease" (with Prof. Nicola Toschi, University of Rome "Tor Vergata").

EUR 17000

2014-2015, DARPA

Investigator

"Multi-Resolution Hierarchical Brain Network Modeling Aim4 – DECODE" (with Dr. Emad Eskandar, MGH)

2014-2015, Massachusetts General Hospital

Principal Investigator Grant: MGH-ECOR Interim Support Fund

"Characterization of Dynamic Autonomic Signatures of Sedation and Nociception", USD 75,000

2013-2014, Mind and Life Institute

Principal Investigator, Grant: Francisco J. Varela Res. Award

"A Longitudinal Training Study to Delineate the Specific Causal Effects of Open Monitoring Versus Focused Attention Techniques on Emotional Regulation Skills"

USD 15,000

2012-2014, Massachusetts General Hospital

Principal Investigator, Grant: MGH-ECOR Interim Support Fund

"Multivariate Point Process Models of Human Cardiovascular Control Dynamics" USD 50,000

2012-2014, Brigham and Women's hospital

Co-Investigator, Grant: BWH/Brain & Behavior Research Foundation

"Evaluation of Yoga Practice on Cardiovascular and Autonomic Health for Sleep Disturbances in Post-Traumatic Stress Disorder (PTSD)" (with Dr. Jessica Noggle, BWH)

2012-2014, National Institutes of Health

Co- Investigator, Grant: NIDDK R21DK097499

"Brain Mechanisms for Autonomic Outflow and Nausea in Cyclic Vomiting Syndrome" (with Drs. Braden Kuo and Vitaly Napadow, MGH)

2007-2013, National Institutes of Health

Principal Investigator, Grant: NHLBI R01HL084502

"Point Process Models of Human Heart Beat Interval Dynamics"

USD 1,250,000

2008-2009, Massachusetts General Hospital

Principal Investigator , Grant: CIMIT Science Award

"A Computational Tool Based on Heart Beat Dynamics to Predict Apnea Episodes in Premature Infants"

USD 40,000

2004-2009, National Institutes of Health

Co-Investigator, Grant: NIMH R01MH59733

"Statistical Analysis of Hippocampal Information Encoding" (with Dr. Emery N Brown, MGH)

PATENTS

- "Realtime Monitoring and Analysis of Heart-Beat Dynamics". Patent Pending US application # 11/209,195 (MGH 2336) Pub. # US 2006/0089559 Pub. Date Apr 27, 2006: ABANDONED
- "Systems and Methods for Inhibiting Apneic Events". Patent Pending US application (Provisional Application Serial No.61/528,994, Practitioner's Docket No. 002806-071541-PCT). Submitted Aug 31, 2012
- "System and Method for Sympathetic and Parasympathetic Activity Monitoring by Heartbeat". Patent Pending US application (International Application No. PCT/US2016/044844, Attorney Docket No. 125141.02886.MGH23346). International Filing Date July 29, 2016

TECHNICAL SKILLS AND COMPETENCES

Page 8 - Curriculum vitae of
Riccardo BARBIERI

Programming Languages and Tools: MATLAB, C++, FORTRAN

Platforms: UNIX, LINUX, WINDOWS, IOS

<http://www.deib.polimi.it/eng/people/dettagli/992020>

*With computers, specific kinds of
equipment, machinery, etc.*

BIOMEDICAL INSTRUMENTATION