

Adaptive algorithm for cardiac period normalization in time

Krivošei, Andrei; Uuetoa, Hasso; Min, Mart; Annus, Paul; Uuetoa, Tiina; Lamp, Jürgen Book of abstracts : 16th International Conference on Electrical Bio-Impedance : 17th Conference on Electrical Impedance Tomography : ICEBI and EIT Stockholm, 19-23 June 2016 2016 / p. 66

Adaptive LINE-P : an adaptive linear energy prediction model for wireless sensor network nodes

Ahmed, Faisal; **Tamberg, Gert; Le Moullec, Yannick; Annus, Paul** Sensors 2018 / art. 1105, 26 p. : ill
<https://doi.org/10.3390/s18041105> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

Advantages and limitations of an approach to bioimpedance data acquisition and processing relying on fast low bit rate ADCs

Bilinskis, Ivars; Sudars, K.; **Min, Mart; Annus, Paul** BEC 2010 : 2010 12th Biennial Baltic Electronics Conference : proceedings of the 12th Biennial Baltic Electronics Conference : Tallinn University of Technology, October 4-6, 2010, Tallinn, Estonia 2010 / p. 245-248 : ill

An overview of the impedance models of the thorax and the origin of the impedance cardiography signal for modelling of the impedance signals

Mughal, Yar M.; Annus, Paul; Min, Mart; Gordon, Rauno 2014 IEEE International Conference on Biomedical Engineering and Sciences : 8th-10th December 2014, Miri-Malaysia : conference proceedings 2014 / p. 526-531 : ill

Analog front end components for bio-impedance measurement : current source design and implementation = Bioimpedantsi mõõteseadme analoogosa komponendid : vooluallika disain ja realiseerimine

Kasemaa, Argo 2011 <https://digi.lib.ttu.ee/i/?590>

Analysis of instantaneous cardiac EBI signal variability over the heart cycle(s) : non-linear time-scale approach

Krivošei, Andrei; Min, Mart; Annus, Paul; Kõiv, Hip; Aabloo, Alvo; Uuetoa, Tiina EMBEC & NBC 2017 : joint conference of the European Medical and Biological Engineering Conference (EMBEC) and the Nordic-Baltic Conference on Biomedical Engineering and Medical Physics (NBC), Tampere, Finland, June 2017 2018 / p. 940-943 : ill https://doi.org/10.1007/978-981-10-5122-7_235

Analytical evaluation of indoor energy harvesting technologies for WSNs with FYPsim framework

Ahmed, Faisal; Le Moullec, Yannick; Annus, Paul; Mustufa, Y. S. Ashad 2016 International Conference on Industrial Informatics and Computer Systems (CIICS) : March 13-15, 2016, Dubai, UAE 2016 / [6] p. : ill <https://doi.org/10.1109/ICCII.2016.7462423>

Approaches for improving VoIP QoS in WMNs

Meeran, Mohammad Tariq; Annus, Paul; Le Moullec, Yannick 2017 International Conference on Electrical Engineering and Computer Science (ICECOS 2017) : Palembang, Indonesia, 22-23 August 2017 2017 / p. 22-27 : ill
<https://doi.org/10.1109/ICECOS.2017.8167138>

Automatic detection of real and imaginary parts of electrical impedance with single synchronous demodulation channel

Annus, Paul; Priidel, Eiko; Land, Raul; Metshein, Margus; Krivošei, Andrei; Min, Mart; Ratassepp, Madis; Märten, Olev 8th European Medical and Biological Engineering Conference : Proceedings of the EMBEC 2020, November 29 - December 3, 2020 Portorož, Slovenia 2021 / p. 151-157 https://doi.org/10.1007/978-3-030-64610-3_18 [Conference Proceedings at Scopus](#) [Article at Scopus](#)

Autonomous wireless sensor networks : implementation of transient computing and energy prediction for improved node performance and link quality

Ahmed, Faisal; Kervadec, Corentin; **Le Moullec, Yannick; Tamberg, Gert; Annus, Paul** The Computer Journal 2019 / p. 820 - 837
<https://doi.org/10.1093/comjnl/bxy101> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

Availability and variations of cardiac activity in the case of measuring the bioimpedance of wrist

Metshein, Margus; Annus, Paul; Land, Raul; Min, Mart; Aabloo, Alvo 2018 IEEE International Instrumentation and Measurement Technology Conference (I2MTC 2018) : proceedings 2018 / 5 p. : ill <https://doi.org/10.1109/I2MTC.2018.8409684>

A benchmark suite for evaluating the efficiency of test tools

Kruus, Helena; Ubar, Raimund-Johannes; Ellervee, Peeter; Gorev, Maksim; Pesonen, Vadim; Devadze, Sergei; Orasson, Elmet; Brik, Marina; Min, Mart; Annus, Paul; Kruus, Margus; Meigas, Kalju BEC 2012 : 2012 13th Biennial Baltic Electronics Conference : proceedings of the 13th Biennial Baltic Electronics Conference : October 3-5, 2012, Tallinn, Estonia 2012 / p. 85-88 : ill

Binary signals in impedance spectroscopy

Min, Mart; Ojarand, Jaan; Märten, Olev; Paavle, Toivo; Land, Raul; Annus, Paul; Rist, Marek; Reidla, Marko; Parve, Toomas Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference 2012 / p. 134-137 : ill

Bioimpedance and spectroscopy

2021 <https://doi.org/10.1016/C2018-0-04440-0>

Bioimpedance monitoring of tissue transplants

Min, Mart; Annus, Paul; Land, Raul; Paavle, Toivo; Haldre, Eero; Ruus, Rein Proceedings of the 24th IEEE Instrumentation and Measurement Technology Conference IMTC 2007 : Warsaw, Poland, May 1-3, 2007 2007 / [4] p

Bioimpedance monitoring with improved accuracy using three-level stimulus

Paavle, Toivo; Annus, Paul; Kuusik, Alar; Land, Raul; Min, Mart Proceedings of European Conference on Circuit Theory and Design 2007 (ECCTD'07) : Seville, Spain, August 26-30, 2007 2007 / p. 412-415

Bioimpedance sensing - a viable alternative for tonometry in non-invasive assessment of central aortic pressure

Min, Mart; Annus, Paul; Kõiv, Hip; Krivošei, Andrei; Uuetoa, Tiina; Lamp, Jürgen 2017 IEEE International Symposium on Medical Measurements and Applications (MeMeA) : May 7-10, 2017, Rochester, MN, USA : proceedings papers 2017 / p. 373-378 : ill <https://doi.org/10.1109/MeMeA.2017.7985905>

A bio-impedance signal simulator (BISS) for research and training purposes

Muhammad, Yar; Le Moullec, Yannick; Annus, Paul; Krivošei, Andrei 2015 26th Irish Signals and Systems Conference (ISSC) : Institute of Technology Carlow, Ireland, June 24-25, 2015 2015 / [4] p. : ill <https://doi.org/10.1109/ISSC.2015.7163746>

Bioimpedance spectro-tomography system using binary multifrequency excitation [Online resource]

Min, Mart; Lehti-Polojärvi, M.; Hyttinen, Jari; Rist, Marek; Land, Raul; Annus, Paul International journal of bioelectromagnetism Proceedings of the 11th International Conference on Bioelectromagnetism : 23-25 May 2018, Aachen, Germany 2018 / p. 76-79 : ill <http://www.ijbem.org/> <https://publications.rwth-aachen.de/record/723893/files/723893.pdf>

Biopsy needle including bioimpedance probe with optimized sensitivity distribution

Hälonen, Sanna; Kari, Juho; Ahonen, Petri; Elomaa, Timo; Annus, Paul; Kronström, Kai International journal of bioelectromagnetism 2015 / p. 26-30 : ill

Biopsy needle including bioimpedance probe with optimized sensitivity distribution

Mäki, Sanna; Kari, Juho; Ahonen, Petri; Elomaa, Timo; Annus, Paul; Kronström, Kai The 10th International Conference on Bioelectromagnetism : proceedings 2015 / [4] p. : ill

Broadband excitation for short-time impedance spectroscopy

Min, Mart; Pliquet, Uwe; Nacke, T.; Barthel, A.; Annus, Paul; Land, Raul Physiological measurement 2008 / 6, p. S185-S192 : ill

Broadband spectroscopy of a dynamic impedance

Min, Mart; Land, Raul; Paavle, Toivo; Parve, Toomas; Annus, Paul Journal of physics : conference series 2010 / 1, p. 012109

Broadband spectroscopy of dynamic impedances with short chirp pulses

Min, Mart; Land, Raul; Paavle, Toivo; Parve, Toomas; Annus, Paul; Trebbels, Dennis Physiological measurement 2011 / p. 945-958 : ill

CAP waveform estimation from the measured electrical bioimpedance values : patient's heart rate variability analysis

Krivošei, Andrei; Uuetoa, Hasso; Min, Mart; Annus, Paul; Uuetoa, Tiina; Lamp, Jürgen Conference proceedings : 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society : Milan, Italy, August 25-29 2015 2015 / p. 2788-2791 : ill <https://doi.org/10.1109/EMBC.2015.7318970>

Chirp pulse excitation in the impedance spectroscopy of dynamic subjects - signal modelling in time and frequency domain

Min, Mart; Land, Raul; Annus, Paul; Ojarand, Jaan Lecture notes on impedance spectroscopy : measurement, modeling and applications. Vol. 1 2011 / p. 79-82 <https://www.taylorfrancis.com/chapters/edit/10.1201/b11339-17/chirp-pulse-excitation-impedance-spectroscopy-dynamic-subjects%E2%80%94signal-modelling-time-frequency-domain-min-land-annus-ojarand>

CMOS current source for shortened square wave waveforms

Kasemaa, Argo; Annus, Paul BEC 2008 : 2008 International Biennial Baltic Electronics Conference : proceedings of the 11th Biennial Baltic Electronics Conference : Tallinn University of Technology : October 6-8, 2008, Tallinn, Estonia 2008 / p. 119-120 : ill

CMOS low power current source with reduced circuit complexity

Kasemaa, Argo; Rang, Toomas; Annus, Paul IEEE 9th International New Circuits and Systems Conference (NEWCAS) : Bordeaux-France, 26-29 June 2011 : [proceedings] 2011 / p. 17-20 <https://www.semanticscholar.org/paper/CMOS-low-power-current-source-with-reduced-circuit-Kasemaa-Rang/f5e490ce914a4c6c3195586a28147211c928c28d>

CMOS technology based current source with harmonic reducing properties

Kasemaa, Argo; Annus, Paul Elektronika ir elektrotehnika = Electronics and electrical engineering 2010 / 10, p. 143-146 : ill

Comparative characteristics of diffusion-welded high-voltage stacks and connected in series Schottky diodes

Sleptšuk, Natalja; Korolkov, Oleg; Land, Raul; Toompuu, Jana; Annus, Paul; Rang, Toomas BEC 2016 : 2016 15th Biennial Baltic Electronics Conference : proceedings of the 15th Biennial Baltic Electronics Conference : Tallinn University of Technology,

Comparative measurement of cardiac cycle by means of different sensors

Priidel, Eiko; Land, Raul; Sinivee, Veljo; Annus, Paul; Min, Mart 2017 Electronics : proceedings of the 21st International Conference : June 19th-21st, 2017, Palanga, Lithuania 2017 / [5] p. : ill <https://doi.org/10.1109/ELECTRONICS.2017.7995221>

Correlation between electrical bioimpedance and pressure waveform in radial artery and in mechanical pulsating pipe system

Metshein, Margus; Annus, Paul; Land, Raul; Rist, Marek; Min, Mart; Märtens, Olev 2020 IEEE International Instrumentation and Measurement Technology Conference (I2MTC 2020), May 25-29, 2020, Dubrovnik, Croatia : proceedings 2020 <https://doi.org/10.1109/I2MTC43012.2020.9128972>

Crest factor optimization of the multisine waveform for bioimpedance spectroscopy

Ojarand, Jaan; Min, Mart; Annus, Paul Physiological measurement 2014 / p. 1019-1033 : ill

Current source considerations for broadband bioimpedance spectroscopy

Annus, Paul; Min, Mart; Rist, Marek; Ojarand, Jaan; Land, Raul Lecture notes on impedance spectroscopy : measurement, modeling and applications. Vol. 2 2012 / p. 63-73

Decomposition of the EBI signal into components using two channel cross-compensating singular spectrum analysis

Krivošei, Andrei; Min, Mart; Annus, Paul; Butsenko, Maksim 2018 IEEE International Symposium on Medical Measurements and Applications (MeMeA 2018) : proceedings : Rome, Italy, June 11-13, 2018 2018 / 5 p. : ill

Delta-sigma data acquisition module with USB-interface

Annus, Paul; Kaulio, V.; Min, Mart; Kristins, A. Proceedings of the 46th RTU Scientific Conference : Riga, Latvia, 13-14 October, 2005 2005 / p. 26-29

Design of bioimpedance measurement system using direct carrier compensation

Annus, Paul; Lamp, Jürgen; Min, Mart; Paavle, Toivo Proceedings of the European Conference on Circuit Theory and Design : ECCTD'05 : Cork, Ireland, Aug. 29 - Sept. 02, 2005. Vol. III 2005 / p. 23-26 <https://ieeexplore.ieee.org/document/1523051>

Development of a bio-impedance signal simulator on the basis of the regression based model of the cardiac and respiratory impedance signals

Muhammad, Yar; Le Moullec, Yannick; Annus, Paul; Min, Mart 16th Nordic-Baltic Conference on Biomedical Engineering : 16. NBC & 10. MTD 2014 Joint Conferences, October 14-16, 2014, Gothenburg, Sweden 2015 / p. 92-95 : ill

Device and method for monitoring bioimpedance of tissue transplants

Annus, Paul; Haldre, Eero; Kuusik, Alar; Land, Raul; Min, Mart; Paavle, Toivo; Parve, Toomas Info- ja kommunikatsioonitehnoloogia doktorikooli IKTDK teise aastakonverentsi artiklite kogumik : 11.-12. mai 2007, Viinistu kunstimuseum 2007 / lk. 140-143 : ill

Difference sampling in bio-impedance measurement

Annus, Paul; Rist, Marek; Reidla, Marko; Min, Mart Book of abstracts : 16th International Conference on Electrical Bio-Impedance : 17th Conference on Electrical Impedance Tomography : ICEBI and EIT Stockholm, 19-23 June 2016 2016 / p. 67

Digital multichannel bioimpedance analyser : signal processing approaches

Ronk, Ants; Annus, Paul; Kuusik, Alar; Land, Raul; Märtens, Olev Proceedings of the 3rd European Medical & Biological Engineering Conference EMBEC'05 : November 20-25, 2005, Prague, Czech Republic 2005 / [4] p

A digital multichannel bioimpedance analyser : signal processing task and its solution

Annus, Paul; Kuusik, Alar; Land, Raul; Märtens, Olev; Ronk, Ants Proc. of the IEEE Instrumentation and Measurement Technology Conference : IMTC 2006 : Sorrento, Italy, April 24-27, 2006 2006 / p. 1405-1409 <https://doi.org/10.1109/IMTC.2006.328596>

A DSP-based EBI, ECG and PPG measurement platform

Abdullayev, Anar; Rist, Marek; Märtens, Olev; Metshein, Margus; Larras, Benoit; Frappe, Antoine; Gautier, Antoine; Min, Mart; John, Deepu; Cardiff, Barry; Krivošei, Andrei; Annus, Paul IEEE transactions on instrumentation and measurement 2023 / art. 2007808, 8 p <https://doi.org/10.1109/TIM.2023.3320771>

A DSP-based impedance measurement device

Abdullayev, Anar; Märtens, Olev; Rist, Marek; Metshein, Margus; Min, Mart; Annus, Paul 2022 18th Biennial Baltic Electronics Conference (BEC) 2022 / 5 l. <https://doi.org/10.1109/BEC56180.2022.9935588>

Dual-source Linear Energy Prediction (LINE-P) model in the context of WSNs

Ahmed, Faisal; Tamberg, Gert; Le Moullec, Yannick; Annus, Paul Sensors 2017 / art. 1666, p. 1-22 : ill <http://dx.doi.org/10.3390/s17071666>

Electrical bio-impedance based non-invasive method for the central aortic blood pressure waveform estimation

Krivošei, Andrei; Min, Mart; Uuetoa, Hasso; Lamp, Jürgen; Annus, Paul BEC 2014 : 2014 14th Biennial Baltic Electronics Conference : proceedings of the 14th Biennial Baltic Electronics Conference : Tallinn University of Technology, October 6-8, 2014, Tallinn, Estonia 2014 / p. 181-184 : ill

Electrochemical impedance spectroscopy

El-Azazy, Marwa; **Min, Mart; Annus, Paul** Intechopen 2020 <https://www.intechopen.com/books/10054>
<https://doi.org/10.5772/intechopen.92333>

Electrode optimization for bioimpedance based central aortic blood pressure estimation

Metshein, Margus; Kõiv, Hip; Annus, Paul; Min, Mart World Congress on Medical Physics and Biomedical Engineering 2018 : June 3–8, 2018, Prague, Czech Republic (Vol. 2) 2018 / p. 497-501 https://doi.org/10.1007/978-981-10-9038-7_92 [Conference Proceedings at Scopus](#) [Article at Scopus](#) [Article at WOS](#)

Electrode placement strategies for the measurement of radial artery bioimpedance : simulations and experiments

Pesti, Ksenija; Metshein, Margus; Annus, Paul; Kõiv, Hip; Min, Mart IEEE transactions on instrumentation and measurement 2021 / 10 p. : ill <https://doi.org/10.1109/TIM.2020.3011784> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

Energy harvesting technologies - potential application to wearable health-monitoring

Ahmed, Faisal; Le Moullec, Yannick; Annus, Paul The 10th International Conference on Bioelectromagnetism : proceedings 2015 / [4] p. : ill

Estimating the transfer function between the CAP and radial EBI cardiac periods : use of PCA for dominating spectral features analysis

Krivošei, Andrei; Uuetoa, Hasso; Min, Mart; Lamp, Jürgen; Annus, Paul; Uuetoa, Tiina The 10th International Conference on Bioelectromagnetism : proceedings 2015 / [4] p. : ill

Estimating the transfer function between the CAP and radial EBI cardiac periods : use of PCA for dominating spectral features analysis

Krivošei, Andrei; Uuetoa, Hasso; Min, Mart; Lamp, Jürgen; Annus, Paul; Uuetoa, Tiina International journal of bioelectromagnetism 2015 / p. 31-35 : ill

Evaluation of VoIP QoS performance in wireless mesh networks

Meeran, Mohammad Tariq; Annus, Paul; Alam, Muhammad Mahtab; Le Moullec, Yannick Information 2017 / art. 88, p. 1-26 : ill
<https://doi.org/10.3390/info8030088>

Excitation current source for bioimpedance measurement applications : analysis and design

Annus, Paul; Krivošei, Andrei; Min, Mart; Parve, Toomas I2MTC 2008 : IEEE International Instrumentation and Measurement Technology Conference : May 12-15, 2008, Victoria, Canada 2008 / p. 848-853 : ill

Fast precise eddy current measurement of metals

Märtens, Olev; Land, Raul; Min, Mart; Rist, Marek; Annus, Paul; Pokatilov, Andrei 2018 IEEE International Instrumentation and Measurement Technology Conference (I2MTC 2018) : proceedings 2018 / 5 p. : ill <https://doi.org/10.1109/I2MTC.2018.8409781>

Fat prediction in minced meat with low-cost BIA spectrometer

Objartel, Mart; Tamm, Martti; Kraft, Kadri; Annus, Paul; Land, Raul Book of abstracts : 16th International Conference on Electrical Bio-Impedance : 17th Conference on Electrical Impedance Tomography : ICEBI and EIT Stockholm, 19-23 June 2016 2016 / p. 38

Feasibility of utilizing air gapped toroidal magnetic cores for detecting pulse wave in radial artery

Metshein, Margus; Pesti, Ksenija; Min, Mart; Annus, Paul; Märtens, Olev 2020 17th Biennial Baltic electronics conference, Tallinn, Estonia, October 6-8, 2020 : proceedings 2020 / 5 p. : ill <https://doi.org/10.1109/BEC49624.2020.9277197>

Fiducial point estimation solution for impedance cardiography measurements

Märtens, Olev; Metshein, Margus; Abdullayev, Anar; Larras, Benoit; Frappe, Antoine; Gautier, Antoine; Saeed, Maryam; John, Deepu; Cardiff, Barry; Krivošei, Andrei; Annus, Paul; Rist, Marek 2022 IEEE International Instrumentation and Measurement Technology Conference (I2MTC) 2022 / Code 180602 <https://doi.org/10.1109/I2MTC48687.2022.9806596> [Conference Proceedings at Scopus](#) [Article at Scopus](#) [Article at WOS](#)

Flexible inductive coils for wearable cardiorespiratory activity monitoring [Online resource]

Metshein, Margus; Annus, Paul; Min, Mart BEC 2018 : 2018 16th Biennial Baltic Electronics Conference (BEC) : proceedings of the 16th Biennial Baltic Electronics Conference, October 8-10, 2018 2018 / 4 p. : ill <https://doi.org/10.1109/BEC.2018.8600990>

FYPsim : an estimation framework for energy harvesting and energy prediction for WSNs

Ahmed, Faisal; Le Moullec, Yannick; Annus, Paul 2016 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW) : Nantou County, Taiwan, 27-29 May 2016 2016 / p. 291-292 : ill <https://doi.org/10.1109/ICCE-TW.2016.7521033>

FYPsim : evaluation tool for solar-based energy harvesting for WSNs

Ahmed, Faisal; Le Moullec, Yannick; Annus, Paul International journal of bioelectromagnetism 2015 / p. 75-86 : ill

Handheld impedance measurement platform for preliminary analysis in biomedicine and technology

Rist, Marek; Annus, Paul; Jaansoo, T. Lecture notes on impedance spectroscopy : measurement, modeling and applications. Vol. 2 2012 / p. 75-82

Hankel matrix based algorithm for cardiac pulse wave base and peak lines Correction

Krivošei, Andrei; Min, Mart; Annus, Paul; Märten, Olev; Metshein, Margus; Lotamõis, Kristina; Rist, Marek IEEE International Workshop on Medical Measurement and Applications (MEMEA) 2022 / 6 p <https://doi.org/10.1109/MeMeA54994.2022.9856564>

High speed data preprocessing for bioimpedance measurements : architectural exploration

Ellervee, Peeter; Annus, Paul; Min, Mart The 27th NORCHIP Conference : Trondheim, Norway, November 2009 2009 / [4] p <https://ieeexplore.ieee.org/document/5397838>

High voltage diffusion welded stacks on the basis of SiC Schottky diodes

Korolkov, Oleg; Sleptšuk, Natalja; Annus, Paul; Land, Raul; Rang, Toomas ICSRM 2015 : program guide 2015 / p. 73

High-voltage diffusion welded stacks on the basis of SiC Schottky diodes

Korolkov, Oleg; Sleptšuk, Natalja; Annus, Paul; Land, Raul; Rang, Toomas Silicon carbide and related materials 2015 (ICSRM 2015) : selected, peer reviewed papers from the 16th International Conference on Silicon Carbide and Related Materials, October 4-9, 2015, Giardini Naxos, Italy 2016 / p. 790-794 : ill <http://dx.doi.org/10.4028/www.scientific.net/MSF.858.790>

Impedance measurement solution based on the high time resolution DSP

Märten, Olev; Land, Raul; Min, Mart; Annus, Paul; Rist, Marek 2020 IEEE International Instrumentation and Measurement Technology Conference (I2MTC 2020), May 25-29, 2020, Dubrovnik, Croatia : proceedings 2020 <https://doi.org/10.1109/I2MTC43012.2020.9128843>

Improved impedance analyzer with binary excitation signals

Märten, Olev; Land, Raul; Min, Mart; Annus, Paul; Rist, Marek; Reidla, Marko 2015 IEEE 9th International Symposium on Intelligent Signal Processing (WISP 2015) : Siena, Italy, 15-17 May 2015 : [proceedings] 2015 / p. 25-29 : ill

Improved PWM-based sinewave generation : example of the impedance

Abdullayev, Anar; Annus, Paul; Krivošei, Andrei; Metshein, Margus; Märten, Olev; Rist, Marek Automatic control and computer sciences 2023 / p. 449-458 <https://doi.org/10.3103/S0146411623050024>

Improvements in design of spectra of multisine and binary excitation signals for multi-frequency bioimpedance measurement

Land, Raul; Cahill, Brian; Parve, Toomas; Annus, Paul; Min, Mart 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society : EMBS : Boston, Massachusetts USA, August 30 - September 3, 2011 2011 / p. 4038-4041 : ill

Investigation of signal separation for ultrasonic nondestructive evaluation

Peng, Chengxiang; Ratassepp, Madis; Annus, Paul 2022 18th Biennial Baltic Electronics Conference (BEC) 2022 / 6 l. <https://doi.org/10.1109/BEC56180.2022.9935612>

Lock-in integration for detection of tiny bioimpedance variations [Online resource]

Priidel, Eiko; Annus, Paul; Metshein, Margus; Land, Raul; Märten, Olev; Min, Mart BEC 2018 : 2018 16th Biennial Baltic Electronics Conference (BEC) : proceedings of the 16th Biennial Baltic Electronics Conference, October 8-10, 2018 2018 / 4 p. : ill <https://doi.org/10.1109/BEC.2018.8600965>

Method for synchronous sampling in multifrequency bioimpedance measurements

Min, Mart; Parve, Toomas; Annus, Paul; Paavle, Toivo Proceedings of the 23rd IEEE Instrumentation and Measurement Technology Conference (IMTC/06) : Sorrento, Italy, 24-27 April, 2006 2006 / p. 1699-1703

Methods for detection of bioimpedance variations in resource constrained environments

Priidel, Eiko; Annus, Paul; Krivošei, Andrei; Rist, Marek; Land, Raul; Min, Mart; Märten, Olev Sensors 2020 / art. 1363, 16 p. : ill <https://doi.org/10.3390/s20051363> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

Modeling and implementation of linear energy prediction for energy harvesting in intermittently powered wireless sensor nodes = Katkendliku toitega traadita sensorsõlmede energiakorje tulemuse lineaarne ennustus, modelleerimine ja rakendused

Ahmed, Faisal 2018 <https://digi.lib.ttu.ee/i/?9955>

Modeling the dynamics of lung tissue with pulsating blood-flow in pulmonary arteries for bioimpedance simulation

Gordon, Rauno; Annus, Paul International Workshop on Impedance Spectroscopy : IWIS 2013 : abstract book : September 25-27, 2013, Chemnitz University of Technology, Germany 2013 / p. 94-65 : ill

Modelling, design and test of a bioimpedance measurement system with carrier compensation

Annus, Paul; Lamp, Jürgen; Min, Mart; Paavle, Toivo Proceedings of the 46th RTU Scientific Conference : Riga, Latvia, 13-14 October, 2005 2005 / p. 22-25

A modular 6LoWPAN-based wireless sensor body area network for health-monitoring applications

Le Moullec, Yannick; Lecat, Yoann; Annus, Paul; Land, Raul; Kuusik, Alar; Reidla, Marko; Hollstein, Thomas; Reinsalu, Uljana; Tammemäe, Kalle; Ruberg, Priit APSIPA ASC 2014 : Asia-Pacific Signal and Information Processing Association Annual Summit and Conference 2014 : December 9-12, 2014, Siem Reap, city of Angkor Wat, Cambodia 2014 / [4] p. : ill

Modular system for fast impedance spectrum analysis of biomedical objects

Rist, Marek; Reidla, Marko; Märten, Olev; Land, Raul; Min, Mart; Parve, Toomas; Annus, Paul XVth International Conference on Electrical Bio-Impedance (ICEBI) and XIVth Conference on Electrical Impedance Tomography (EIT) : 22-25 April 2013, Heilbad Heiligenstadt : abstracts 2013 / p. 151 : ill

Modular system for spectral analysis of time-variant impedances

Rist, Marek; Reidla, Marko; Land, Raul; Parve, Toomas; Märten, Olev; Annus, Paul; Ojarand, Jaan; Min, Mart 6th European Conference of the International Federation for Medical and Biological Engineering : MBEC 2014, 7-11 September 2014, Dubrovnik, Croatia 2015 / p. 858-861 : ill

Multichannel bioimpedance spectroscopy : instrumentation methods and design principles = Paljukanaliline bioimpedantsspektroskoopia : mõõtemetodid ja disaini printsiibid

Annus, Paul 2009 http://www.ester.ee/record=b2557759*est

Multi-frequency and multi-channel bio-impedance measurement solution [Electronic resource]

Märten, Olev; Min, Mart; Land, Raul; Annus, Paul Proceedings of 7th Nordic Signal Processing Symposium (NORSIG 2006) : Reykjavik, Iceland, June 7-9, 2006 2006 / [4] p. [CD-ROM] <https://ieeexplore.ieee.org/document/4052217>

Multisine and binary multifrequency waveforms in impedance spectrum measurement : a comparative study

Annus, Paul; Min, Mart; Ojarand, Jaan; Paavle, Toivo; Land, Raul; Ellervee, Peeter; Parve, Toomas 5th European Conference of the International Federation for Medical and Biological Engineering : 14-18 September 2011, Budapest, Hungary 2012 / p. 1265-1268 https://link.springer.com/chapter/10.1007/978-3-642-23508-5_327

Mõtleivate asjade maailma poole : [ka Tartu tänavavalgustuse kaugjuhtimissüsteemist]

Annus, Paul Keskkonnatehnika 2008 / 8, lk. 8-10 : ill https://artiklid.elnet.ee/record=b1068040*est

Noninvasive acquisition of the aortic blood pressure waveform

Min, Mart; Kõiv, Hip; Priidel, Eiko; Pesti, Ksenija; Annus, Paul Wearable devices 2019 / 16 p. : ill <https://doi.org/10.5772/intechopen.86065>

Non-invasive method for the aortic blood pressure waveform estimation using the measured radial EBI

Krivošei, Andrei; Lamp, Jürgen; Min, Mart; Uuetoa, Tiina; Uuetoa, Hasso; Annus, Paul XVth International Conference on Electrical Bio-Impedance (ICEBI) and XIVth Conference on Electrical Impedance Tomography (EIT) : 22-25 April 2013, Heilbad Heiligenstadt : abstracts 2013 / p. 121 : ill

Nonlinear chirp pulse excitation for the fast impedance spectroscopy

Ojarand, Jaan; Annus, Paul; Land, Raul; Parve, Toomas; Min, Mart Elektronika ir elektrotehnika = Electronics and electrical engineering 2010 / 4, p. 73-76 : ill

Non-standard electrode placement strategies for ECG signal acquisition

Metshein, Margus; Krivošei, Andrei; Abdullayev, Anar; Annus, Paul; Märten, Olev Sensors 2022 / art. 9351 <https://doi.org/10.3390/s22239351> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

Nonuniform sampling and demodulation for wideband multi-frequency bioimpedance measurements

Min, Mart; Bilinskis, Ivars; Artyukh, Y.; Annus, Paul; Land, Raul; Märten, Olev Proceedings of the "2007 Workshop on digital Alias-free Signal Processing" (WDASP'07) : 17 April 2007, London, UK 2007 / [7] p

Notes on applicability of the impedance spectroscopy for characterization of materials and substances

Annus, Paul; Land, Raul; Min, Mart; Reidla, Marko; Rist, Marek I2MTC 2016 : 2016 IEEE International Instrumentation and Measurement Technology Conference : May 23-26, 2016, Taipei International Convention Center, Taipei, Taiwan : proceedings 2016 / p. 1052-1057 : ill <https://doi.org/10.1109/I2MTC.2016.7520513>

Notes on signals for simultaneous multipoint impedance spectroscopy

Priidel, Eiko; Min, Mart; Annus, Paul International Workshop on Impedance Spectroscopy : IWIS 2016 : September 26-28, 2016, Technische Universität Chemnitz, Germany : abstract book 2016 / p. 6-7 : ill

On-Desk Model-Based Study for Evaluating the Effect of Squeezing the Arteries in the Forearm on the Bioimpedance and Pressure of Blood

Metshein, Margus; Annus, Paul; Land, Raul; Rist, Marek; Min, Mart; Lotamõis, Kristina; Märtens, Olev Journal of sensors 2023 / art. 5710835 <https://doi.org/10.1155/2023/5710835>

Operating wireless sensor nodes without energy storage : experimental results with transient computing

Ahmed, Faisal; Ahmed, Tauseef; Muhammad, Yar; Le Moullec, Yannick; Annus, Paul Electronics 2016 / art. 89, p. 1-14 : ill <http://dx.doi.org/10.3390/electronics5040089>

Optimisation of multisine waveform for bio-impedance spectroscopy

Ojarand, Jaan; Annus, Paul; Min, Mart XVth International Conference on Electrical Bio-Impedance (ICEBI) and XIVth Conference on Electrical Impedance Tomography (EIT) : 22-25 April 2013, Heilbad Heiligenstadt : abstracts 2013 / p. 79 : ill

Optimization of multisine excitation for a bioimpedance measurement device

Ojarand, Jaan; Annus, Paul; Min, Mart; Gorev, Maksim; Ellervee, Peeter I2MTC 2014 IEEE International Instrumentation and Measurement Technology Conference : Instrumentation and Measurement for Sustainable Development : Radisson Montevideo Victoria Plaza Hotel & Conference Center, May 12-15, 2014, Montevideo, Uruguay : proceedings 2014 / p. 829-832 : ill

Optimized waveforms for synchronous signal processing

Annus, Paul; Min, Mart; Ojarand, Jaan Info- ja kommunikatsioonitehnoloogia doktorikooli IKTDK kolmanda aastakonverentsi artiklite kogumik : 25.-26. aprill 2008, Voore külalistemaja 2008 / p. 51-54 : ill

A parametric framework for modelling of bioelectrical signals = Parameetiline raamistik bioelektriliste signaalide modelleerimiseks

Muhammad, Yar 2015 http://www.estee.ee/record=b4473232*est

A parametric framework for the development of bioelectrical applications : application to a bio-impedance signal simulator

Muhammad, Yar; Annus, Paul; Le Moullec, Yannick; Rang, Toomas Proceedings of the Estonian Academy of Sciences 2016 / p. 345-357 : ill <https://doi.org/10.3176/proc.2016.4.03>

PLL-based extraction of the cardiac component from the bio-impedance signal

Märtens, Olev; Min, Mart; Annus, Paul; Land, Raul; Krivošei, Andrei; Metshein, Margus 2018 IEEE International Instrumentation and Measurement Technology Conference (I2MTC 2018) : proceedings 2018 / 6 p. : ill <https://doi.org/10.1109/I2MTC.2018.8409848>

QUADRA impedance spectroscopy devices for dynamic measurements of bio-objects

Rist, Marek; Reidla, Marko; Märtens, Olev; Min, Mart; Annus, Paul; Land, Raul; Parve, Toomas 34th Annual International IEEE EMBS Conference : August 28 - September 1, 2012, Hilton Bayfront Hotel in San Diego, California, USA : abstracts 2012 / p. 557 : ill

Quantization of the response signal differences for the electrical bioimpedance measurement

Annus, Paul; Land, Raul; Priidel, Eiko; Metshein, Margus; Min, Mart; Märtens, Olev EMBEC & NBC 2017 : joint conference of the European Medical and Biological Engineering Conference (EMBEC) and the Nordic-Baltic Conference on Biomedical Engineering and Medical Physics (NBC), Tampere, Finland, June 2017 2018 / p. 290-293 : ill https://doi.org/10.1007/978-981-10-5122-7_73

Realization and evaluation of the device for measuring the impedance of human body for detecting the respiratory and heart rate

Metshein, Margus; Parve, Toomas; Annus, Paul; Rist, Marek; Min, Mart Elektronika ir elektrotehnika = Electronics and electrical engineering 2017 / p. 36-42 : ill <http://dx.doi.org/10.5755/j01.eie.23.3.18330>

Reconfigurable data acquisition unit for bioimpedance measurements

Pesonen, Vadim; Gorev, Maksim; Annus, Paul; Min, Mart; Ellervee, Peeter BEC 2010 : 2010 12th Biennial Baltic Electronics Conference : proceedings of the 12th Biennial Baltic Electronics Conference : Tallinn University of Technology, October 4-6, 2010, Tallinn, Estonia 2010 / p. 257-260 : ill

Rectangular wave excitation in wideband bioimpedance spectroscopy

Min, Mart; Paavle, Toivo; Annus, Paul; Land, Raul IEEE International Workshop on Medical Measurements and Applications : MeMeA2009 : Cetraro, Italy, May 29-30, 2009 2009 / p. 268-271

Regression based model of the impedance cardiac and respiratory signals for the development of a bio-impedance signal simulator

Mughal, Yar M; Annus, Paul Doctoral School in Information and Communication Technology : proceedings of doctoral session of BEC 2014 : October 6-8 2014, Laulasmaa 2014 / p. 15-18 : ill

Reprogrammable data acquisition unit to reduce aliasing effect in bioimpedance measurements

Pesonen, Vadim; Gorev, Maksim; Annus, Paul; Min, Mart; Ellervee, Peeter The 7th Annual FPGA World Conference,

Robust algorithm for the augmentation index estimation of the CAP using low order derivatives [Electronic resource]
Krivošei, Andrei; Min, Mart; Lamp, Jürgen; Annus, Paul MeMeA 2014 : IEEE International Symposium on Medical Measurements and Applications : June 11-12, 2014, ISCTE, University of Lisbon, Lisbon, Portugal : proceedings 2014 / p. 279-282 : ill. [CD-ROM]

Scalable impedance spectroscopy : comparative study of sinusoidal and rectangular chirp excitations
Min, Mart; Parve, Toomas; Land, Raul; Annus, Paul Lecture notes on impedance spectroscopy : measurement, modeling and applications. Vol. 2 2012 / p. 33-38

Sensor-location-specific joint acquisition of peripheral artery bioimpedance and photoplethysmogram for wearable applications
Metshein, Margus; Abdullayev, Anar; Gautier, Antoine; Larras, Benoit; Frappe, Antoine; Cardiff, Barry; Annus, Paul; Land, Raul; Märten, Olev Sensors 2023 / art. 7111 <https://doi.org/10.3390/s23167111>

Separation of cardiac and respiratory components from the electrical bio-impedance signal using PCA and fast ICA
Mughal, Yar M.; Krivošei, Andrei; Annus, Paul International Conference on Control Engineering & Information Technology (CEIT'13), Sousse, Tunisia, June 04-07, 2013 : [proceedings] 2013 / [4] p

Shortened square wave waveforms in synchronous signal processing
Annus, Paul; Min, Mart; Ojarand, Jaan I2MTC 2008 : IEEE International Instrumentation and Measurement Technology Conference : May 12-15, 2008, Victoria, Canada 2008 / p. 1259-1262 : ill

Signals in bioimpedance measurement : different waveforms for different tasks
Min, Mart; Pliquet, Uwe; Nacke, T.; Barthel, A.; Annus, Paul; Land, Raul 13th International Conference on Electrical Bioimpedance and 8th Conference on Electrical Impedance Tomography 2007 : ICEBI2007 : August 29th - September 2nd 2007, Graz, Austria 2007 / p. 181-184
https://www.researchgate.net/publication/226357858_Signals_in_bioimpedance_measurement_Different_waveforms_for_different_tasks

Simple signals for system identification
Annus, Paul; Land, Raul; Min, Mart; Ojarand, Jaan Fourier transform - signal processing 2012 / p. 257-276 : ill

Simplified signal processing for impedance spectroscopy with spectrally sparse sequences
Annus, Paul; Land, Raul; Reidla, Marko; Ojarand, Jaan; Mughal, Yar M.; Min, Mart XVth International Conference on Electrical Bio-Impedance (ICEBI) and XIVth Conference on Electrical Impedance Tomography (EIT) : 22-25 April 2013, Heilbad Heiligenstadt : abstracts 2013 / p. 76

Smart, wireless modular communication platform
Ruberg, Priit; Hollstein, Thomas; Reinsalu, Uljana; Tammemäe, Kalle; Le Moullec, Yannick; Kuusik, Alar; Reidla, Marko; Annus, Paul Proceedings of the 8th Annual Conference of the Estonian National Doctoral School in Information and Communication Technologies : December 5-6, 2014, Rakvere 2014 / p. 111-112 : ill

Some errors during impedance measurement
Annus, Paul; Land, Raul; Min, Mart Book of abstracts : 16th International Conference on Electrical Bio-Impedance : 17th Conference on Electrical Impedance Tomography : ICEBI and EIT Stockholm, 19-23 June 2016 2016 / p. 90

Some observations on impedance and Ferranti effect
Land, Raul; Min, Mart; Annus, Paul The 10th International Conference on Bioelectromagnetism : proceedings 2015 / [2] p. : ill

Study of electrode locations for joint acquisition of impedance- and electro-cardiography signals
Metshein, Margus; Gautier, Antoine; Larras, Benoit; Frappe, Antoine; John, Deepu; Cardiff, Barry; Annus, Paul; Land, Raul; Märten, Olev 2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) Oct 31 - Nov 4, 2021 : virtual conference 2021 / p. 7264-7267 : ill <https://doi.org/10.1109/EMBC46164.2021.9629504> [Conference Proceedings at Scopus](#) [Article at Scopus](#) [Article at WOS](#)

Synchronous sampling and demodulation in an instrument for multifrequency bioimpedance measurement
Min, Mart; Parve, Toomas; Ronk, Ants; Annus, Paul; Paavle, Toivo IEEE transactions on instrumentation and measurement 2007 / 4, p. 1365-1372 : ill <https://ieeexplore.ieee.org/document/4277035>

The current state of voice over Internet protocol in wireless mesh networks
Meeran, Mohammad Tariq; Annus, Paul; Le Moullec, Yannick 2016 International Conference on Advances in Computing, Communications and Informatics (ICACCI) : September 21-24, 2016, The LNM Institute of Information Technology (LNMIT), Jaipur, India 2016 / p. 2567-2575 : ill <https://doi.org/10.1109/ICACCI.2016.7732444>

Time-frequency impedance spectroscopy : excitation considerations
Land, Raul; Annus, Paul; Min, Mart Proceedings of the 15th IMEKO TC4 International Symposium on Novelties in Electrical

Measurements and Instrumentations : Iasi, Romania, September 18-22, 2007. 1 2007 / p. 328-331

TMS320F2811-based multi-frequency multi-channel bio-impedance measurement device

Märtens, Olev; Min, Mart; Land, Raul; Liimets, Aivar; Trampärk, Harri; Annus, Paul EDERS 2008 : 3rd European DES Education & Research Symposium : proceedings : Tel Aviv, Israel, 18th June 2008 / p. 179-183. [CD-ROM]

Tänavavalgustuse tsentraalne juhtimine ja kontroll GSM-võrgu abil

Annus, Paul; Haldre, Eero; Min, Mart Raadiotehnika 2005 : XII rahvusvahelise telekommunikatsioonipäeva materjalid 2005 / lk. 133-137 : ill

Vaba konfiguratsiooniga kontrollervõrgust

Annus, Paul Telekommunikatsioon 2002 : IX rahvusvahelise telekommunikatsioonipäeva materjalid 2002 / lk. 33-35

Variation of cardiac and respiratory waveform on human thorax in the case of inductive coupling

Metshein, Margus; Annus, Paul; Land, Raul; Krivošei, Andrei; Ojarand, Jaan; Aabloo, Alvo; Min, Mart EMBEC & NBC 2017 : joint conference of the European Medical and Biological Engineering Conference (EMBEC) and the Nordic-Baltic Conference on Biomedical Engineering and Medical Physics (NBC), Tampere, Finland, June 2017 2018 / p. 671-674 : ill https://doi.org/10.1007/978-981-10-5122-7_168

Wearable data acquisition system of multimodal physiological signals for personal health care

Annus, Paul; Samiepour, Ali; Rist, Marek; Ruiso, Indrek; Krivošei, Andrei; Land, Raul; Parve, Toomas; Min, Mart pHealth 2013 : proceedings of the 10th International Conference on Wearable Micro and Nano Technologies for Personalized Health : June 26-28, 2013, Tallinn, Estonia 2013 / p. 107-112 : ill

Wearable solutions for monitoring cardiorespiratory activity = Kehal kantavad vahendid kardiorespiratoorse aktiivsuse jälgimiseks

Metshein, Margus 2018 <https://digi.lib.ttu.ee/i/?9961>

Wearable system for non-invasive and continuous monitoring central aortic pressure curve and augmentation index

Krivošei, Andrei; Lamp, Jürgen; Min, Mart; Uuetoa, Tiina; Uuetoa, Hasso; Annus, Paul pHealth 2013 : proceedings of the 10th International Conference on Wearable Micro and Nano Technologies for Personalized Health : June 26-28, 2013, Tallinn, Estonia 2013 / p. 101-106 : ill

Wideband object identification with rectangular wave chirp excitation

Paavle, Toivo; Min, Mart; Annus, Paul; Birjukov, Andrei; Land, Raul; Parve, Toomas ECCTD'09 : European Conference on Circuit Theory and Design 2009 : Antalya, Turkey, August 23-27, 2009 2009 / p. 421-424 <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=5275007>