

# CURRICULUM VITAE

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## EDUCATION

- Master of Health Administration (MHA), Institute of Health and Society, University of Oslo (UiO), 2021-2024  
Title: Promoters and Barriers to Research Collaboration in Developing the Intervention Center to Become an Internationally Leading Norwegian Center of Excellence.  
*Supervisor: Associate Professor Ivan Spehar, UiO, Oslo*
- Doktor ingeniør (Ph.D.), Department of Telecommunications, Norwegian University of Science and Technology (NTNU), Trondheim, 1993-1998  
Title: On Optimal Perfect Reconstruction Filter Banks for Image Compression.  
*Supervisor: Professor Tor A. Ramstad, NTNU, Trondheim*
- Sivilingeniør (M.Sc.), Department of Telecommunications, Norwegian Institute of Technology, Trondheim, 1989-1993.  
Master thesis was performed at the University of California, Santa Barbara (UCSB), USA, 1992-1993.  
Title: Efficient adaptive filtering based on new structures and techniques.  
*Supervisor: Professor Sanjit K. Mitra, UCSB, USA*

## CONTINUOUS EDUCATION

- Research Leadership Program, University of Oslo, Norway, 2015
- FELASA Course on Laboratory Animal Science for Research Workers, Norwegian School of Veterinary Science, Oslo, Norway, 2012
- Compulsory Course in Pedagogy for Faculty, Norwegian University of Science & Technology, Trondheim, Norway, 2007
- Project Management, Norwegian School of Management, Oslo, Norway, 2004

## POSITIONS

- Head of Section for Medical ICT Research, Intervention Center, Oslo University Hospital, Rikshospitalet, Oslo, 2015-present.
- Professor, Department of Electronic Systems, Norwegian University of Science & Technology (NTNU), Trondheim, 2006-present.

- Head of Sensor Network Research Group, Intervention Center, Oslo University Hospital, Rikshospitalet, Oslo, 2006-present.
- Professor by courtesy, Frontier Institute (Medical ICT), Nagoya Institute of Technology, Japan, 2016-2017.
- Visiting Professor, University of Maryland, College Park, USA, Jun.-Jul. 2009.
- Sr. Scientist, Intervention Center, Oslo University Hospital, Rikshospitalet, Oslo, 2002-2005.
- Co-founding R&D Engineer, Fast Search & Transfer ASA (now Microsoft Development Center Norway), Oslo, 1998-2002
- Research Fellow, Norwegian University of Science and Technology, Trondheim, 1996-1998
- Visiting Research Associate, University of Linköping, Sweden, Jun.- Aug. 1995
- Teaching Assistant, Norwegian University of Science and Technology, Trondheim, 1993-1995
- IAESTE Trainee, British Broadcasting Cooperation (BBC) Belfast, UK, Jun.-Aug. 1992

## SCIENTIFIC FIELDS OF INTEREST

- Molecular Communications.
- Wireless Body-Area Networks.
- Intra-Body Sensor Communications.
- Medical Signal and Image Processing.
- Microwave Medical Sensing and Imaging.
- Statistical Image and Signal Processing including Machine Learning Techniques.
- Wireless Sensor Networks.

## TEACHING EXPERIENCE

- PhD level intensive course, "Nanoscale Communication Technologies", University of Oulu, Finland, 2015.
- Graduate course, "Biomedical Signal and Image Processing, and Communications", Norwegian University of Science and Technology, 2006-present.
- Graduate course, "PhD Seminar in Signal Processing", Norwegian University of Science and Technology, 2006-present.
- Graduate course, "Digital Signal Processing", Norwegian University of Science and Technology, 1996-1997.

## EXAMPLES OF LEADERSHIP IN INDUSTRIAL INNOVATION

- Co-founder of Salveo Solutions AS, Norway in 2022. Based on research performed at NTNU and Oslo University Hospital, the company is developing wireless video capsule endoscopy (smart pill) to inspect the gastrointestinal tract for anomalies, including precancerous lesions.
- Established industry cooperation with OmniVision Technologies Norway AS to develop the next-generation medical image sensor (2014-2019). The project has two industry PhD students jointly funded by the company and the Research Council of Norway.
- Co-founder of Oslo Medtech Cluster ([www.oslomedtech.no](http://www.oslomedtech.no)) in 2009. It has ca. 180 members: companies, hospitals, investment firms, and research institutions, all with a focus on medical technology and innovation.
- Member of the Norwegian Digital Imaging and Communications in Medicine (DICOM) working group 2009-2012.
- Member of the Body Area Network (IEEE 802.15.BAN) standard development group, 2007 - 2009

- Co-founder of Fast Image Transfer AS, Norway in 1997. The company was renamed as Fast Search and Transfer ASA (FAST) in 1998. FAST was acquired by Microsoft Inc. and was named Microsoft Development Center Norway in 2008. At FAST we developed the first image and video streaming scheme for mobile, hand-held devices like smart phones using the 2.5G mobile communication network 1998-2002.
- Member of the Norwegian image codec proposal to the JPEG2000 competition in 1996. It was ranked no. 3 out of 20 proposals.
- Member of the Norwegian MPEG4 standardization committee, 1994-1995.

## ADMINISTRATIVE EXPERIENCE

- Section Manager for Medical ICT Research at the Intervention Center, Oslo University Hospital, 2015-present.
- Chair of the International Master Program in Medical Signal and Image Processing, Norwegian University of Science and Technology, 2007-2014.
- Member of the PhD Admission Committee for Medical Technology, Norwegian University of Science and Technology, 2009-2011.
- Group Leader for Biomedical Sensor Networks at the Intervention Center, Oslo University Hospital, 2006-present.

## TOTAL EXTERNAL FUNDING RECEIVED

- Total 252 million NOK (2005-present)

## RESEARCH PROJECTS AND MANAGEMENT

1. PI/Project Leader of SCOPE: Semantic Feature-based Communication and Control for Wireless Body Sensor-Actuator Networks (Funded by the Research Council of Norway, IKTPluss program, 01.04.2026-30.06.2030, award NOK 12.0 million)
2. Co-PI of SYNAPSE: SYnergetic Network-AI Platform for Semantic Efficiency (Funded by the Research Council of Norway, IKTPluss program, 01.04.2026-31.07.2029, award NOK 12.0 million)
3. Co-PI of SENSUS: Meaning-Centric Bio-Inspired Communication Systems, (Funded by the Research Council of Norway, IKTPluss program, 01.06.2026-31.05.2030, award NOK 12.0 million)
4. PI of AMAZING 6G, (Funded by the European Commission HORIZON-JU-SNS-2024-STREAM-D-01-01 program, 01.01.2025 - 31.12.2028, award €14.2 million)
5. PI/Work Package Leader of CybAlliance: International Alliance for Strengthening Cybersecurity and Privacy in Healthcare, (Funded by the Research Council of Norway, INPART program, 01.03.2023-28.02.2028, award NOK 10.0 million)
6. Co-Project Manager/PI of Preoperative Data Models for Personalized Survival and Treatment Analysis for Patients with Colorectal Liver Metastases, (Funded by Health South East Trust, Research Program, 01.01.2023-31.12.2025, award NOK 9.0 million)
7. Project Manager/PI of Development of RF Sensors for Heart, (Funded by Health South East Trust, Innovation Program, 01.04.2022-31.03.2023, award NOK 0.5 million)
8. PI/Work Package Leader of of Wireless Brain-Connect Interface to Machines (B-CRATOS), (Funded by the European Commission H2020:Future Emerging Technologies (FET) Open Program, 01.03.2021- 28.02.2025, award €4.475 million)
9. Project Manager/PI of Internet of Bio-NanoThings for Prediction and Prevention of Infectious Diseases (CLIPÉUS) (Funded by the Research Council of Norway, IKTpluss program, 01.09.2020 - 31.12.2027, award NOK 16 million)
10. PI/Work Package Leader of Reliable Technologies and Models for Verified Wireless Body-Centric Transmission and Localization (ROVER)  $i/b_i$ , (Funded by the European Commission H2020-MSCA-RISE, 01.01.2020-31.12.2025, award EUR 1 million) $i/li_i$

11. Project Manager/PI of Communication Theoretical Foundation of Wireless Nanonetworks (CIRCLE), (Funded by the Research Council of Norway, FRINATEK program, 01.09.2019 - 31.12.2026, award NOK 10 million)
12. PI of Next-Generation Theranostics of Brain Pathologies With Autonomous Externally Controllable Nanonetworks: A Transdisciplinary Approach With Bio-Nanodevices Interfaces (GLADIATOR), (Funded by the European Commission, H2020:Future Emerging Technologies (FET) Open Program, 01.01.2019-30.09.2023, award €5.9 million)
13. PI of High Data-Rate Wireless Communication for Deep Medical Implants, (Funded by the Research Council of Norway, FORNY program, 01.01.2018 - 01.05.2020, award NOK 5 million)
14. Project Manager/PI of Investigator of Development of Real-time Automatic Polyp Detection Systems in Colonoscopy, (Funded by Health South East Trust, Innovation Program, 01.09.2018-31.08.2019, award 0.5 NOK million)
15. Management Member of COST Action CA 17115 European network for advancing Electromagnetic hyperthermic medical technologies (MyWave) (Funded by COST, Research Council of Norway and Ministry of Foreign Affairs, 01.12.2018-30.11.2022)
16. Project Manager/PI of Wireless In-Body Sensor and Actuator Networks (WINNOW), (Funded by the Research Council of Norway, IKTpluss program, 01.04.2017 - 31.12.2023, award NOK 16 million)
17. Coordinator/PI of Wireless In-Body Environment (WiBEC), (Funded by the European Commission, H2020- Marie Skłodowska-Curie Actions (MSCA-ITN-2015), 01.01.2016-31.12.2019, award €3.957 million, <http://www.wibec.eu>)
18. PI of Battery free wireless implant device, (Funded by the South-Eastern Norway Regional Health Authority, Innovation Grant, 01.01.2016-31.12.2016, award NOK 0.5 million)
19. PI of Holistic Monitoring of Indoor Environment (HOME), (Funded by the Research Council of Norway, Idealab program, 01.06.2014 - 31.05.2017, award NOK 10 million)
20. PI of Wireless HD Camera Pill, (Funded by the South-Eastern Norway Regional Health Authority, Innovation Grant, 01.01.2014-31.12.2014, award NOK 0.7 million)
21. Management Committee Member of COST project BM139 European Network of Innovative uses of EMFs in Biomedical Applications, (Funded by COST/EU, Research Council of Norway and Ministry of Foreign Affairs, 01.04.2014-31.03.2017)
22. Project Manager/PI of Medical Sensing, Localization, and Communications using Ultra Wideband Technology (MELODY II), (Funded by the Research Council of Norway, VERDIKT program, 01.01.2013 - 31.12.2017, award NOK 14.7 million, <http://www.melody-project.info>)
23. PI of Norwegian, Bosnian and Serbian Cooperation Platform for University and Industry in ICT R&D (NORBAS), (Funded by the Ministry of Foreign Affairs under the HERD/ICT for Balkan, 01.01.2012 - 31.12.2015, award 6.25 million)
24. Co-PI of the Adaptive Security for Smart Internet of Things in eHealth (ASSET), (Funded by the Research Council of Norway, VERDIKT program, 02.01.2012-30.06.2015, award NOK 13.7 million)
25. PI of Medical Cloud and Cancer App, (Funded by the South-Eastern Norway Regional Health Authority, Innovation Grant, 01.01.2012-31.12.2012, award NOK 0.7 million)
26. Founding Member of Oslo Medtech Cluster, (Funded by Innovation Norway, SIVA and Research Council of Norway - ARENA program, 01.11.2009 - 31.10.2012, award NOK 17.4 million; <http://www.oslomedtech.no>)
27. Management Member of COST project IC 0905 Techno-Economic Regulatory Framework for Radio Spectrum Access for Cognitive Radio/Software Defined Radio (TERRA), (Funded by COST, Research Council of Norway and Ministry of Foreign Affairs, 01.12.2009-31.05.2014)
28. Management Member of COST project IC 0902 "Cognitive Radio and Networking for Cooperative Coexistence of Heterogeneous Wireless", (Funded by COST/EU, Research Council of Norway and Ministry of Foreign Affairs, 01.11.2009-31.10.2013)
29. PI of Automatic Translation of Electronic Patient Record, (Funded by National Network of User Driven Innovation in Medicine (Innomed), 01.01.09 - 31.12.09, award NOK 0.8 million)

30. Work Package Leader/PI of Biomedical Wireless Sensor Network (BSWN II), (Funded by the Innovation Norway, NUTEC Sweden, and Nordic Innovation Centre, 01.06.2008 - 31.12.2009, award NOK 8.0 million; <http://www.bwsn.net>)
31. Project Manager/PI of Medical Sensing, Localization, and Communications using Ultra Wide-band Technology (MELODY), (Funded by the Research Council of Norway, VERDIKT program, 01.09.2008 - 31.12.2012, award NOK 33 million, <http://www.melody-project.info>)
32. Work Package Leader/PI of In-vivo Ultrasonic Transponder System for Biomedical Applications (ULTRASPONDER), (Funded by the European Commission, 7th Framework Program, STREP, 01.09.2008 - 31.06.2012, award €4.4 million; <http://www.ultrasponder.org>)
33. Project Manager/PI of Strategies for Seamless Deployment of Mobile Patient Monitoring Systems (SAMPOS), (Funded by the Research Council of Norway - VERDIKT program, 01.10.2006 - 31.12.2010, award NOK 5.3 million; <http://www.iet.ntnu.no/projects/sampos>)
34. Project Manager/PI of Wireless Biomedical Sensor Networks (WISENET), (Funded by the Research Council of Norway - SUPIKT program, 01.09.2006 - 31.12.2010, award NOK 6 million; <http://www.iet.ntnu.no/projects/wisenet>)
35. Co-PI of Modeling and Analysis of Evolutionary Structures for Distributed Services (CREDO), (Funded by the European Union 6th Framework Program, STREP, 01.09.2006 - 31.08.2009, award €3.5 million; <http://old-www.cwi.nl/projects/credo>)
36. Co-PI of Active Behavioral Interfaces for Seamless Network Integration (CONNECT), (Funded by the Research Council of Norway - VERDIKT program, 01.11.2007 - 31.12.2011, award NOK 2.4 million; <http://www.ifi.uio.no/forskning/grupper/pma/connect>)
37. Work Package Leader/PI of Wireless Medical Systems (WIRMED), (Funded by the Research Council of Norway - BIA program, 01.09.2006 - 31.12.2009, award NOK 2.3 million)
38. PI of Wireless Patient, (Funded by the Research Council of Norway - VERDIKT program, 01.06.2007 - 31.05.2010, award NOK 6.0 million; <http://www.sintef.no/Projectweb/Tradlospasient>)
39. PI of Medical Radar, (Funded by the Research Council of Norway - FORNY program, 01.09.2006 - 31.12.2007, award NOK 1.6 million)
40. Work Package Leader/PI of Biomedical Wireless Sensor Network (BSWN), (Funded by the Innovation Norway, NUTEC Sweden, and Nordic Innovation Centre, 01.09.2006 - 31.12.2007, award NOK 8.0 million)
41. PI of Wireless Health & Care, a multidisciplinary industrial project. (Funded by the Research Council of Norway - BIP program, 01.01.2003 - 31.12.2005, NOK 8.2 million)
42. PI of Communication of Medical Images, Text, and Messages in Enterprise-wide Systems - a solution for transmission of ultrasound images for quick heart diagnosis (COMMITMENT). (Funded by the Research Council of Norway - HØYKOM program, 01.01.2003-31.12.2004, NOK 5.9 million)
43. PI of Image Processing for Augmented Reality Interactive Real time 3D/4D Visualization. (Funded by Silicon Graphics Inc., CA, USA, 01.04.2002 - 31.03.2003, US\$ 0.250 million)

## INVITED PRESENTATIONS TO PEER-REVIEWED, INTERNATIONALLY ESTABLISHED CONFERENCES

### Keynote Speaker

- "Semantic Molecular Communication Technology", 9th Workshop on Molecular Communications (MolCom25), Catania, Italy, Apr. 2025.
- "Molecular Communication Technology for Human Medicine", 5th Molecular Communications Workshop Organized by the Technical Committee on Molecular, Biological and Multi-Scale Communications of the IEEE Communications Society, Virtual, Nov. 2021.
- "Internet of smart implants: micro-nan scale devices with artificial intelligence connected to 5G networks", International Conference on Contemporary Computing and Applications, Lucknow, India, Feb. 2020.

- "Technology Challenges for the NextGen Wireless Capsule Video Endoscopy", The 10th IEEE Int. Symposium Medical ICT (ISMICT'16), Boston, USA, Mar. 2016.
- "Intra-Body Communications, Localization, and Imaging Using RF and Molecular Signals", IEEE Signal Processing and Integrated Networks Conference, New Delhi, India, Feb. 2015.
- "Neuronal communication networks: modeling and simulation for memory formation and plasticity", The 17th IEEE Int. Symposium on Wireless Personal Multimedia Communications (WPMC'2014), Sydney Australia, Sep. 2014.
- "Medical sensing and intra-body communication using ultra wideband technology", The X International Symposium on Information and Communication Technologies INTSIKT 2014, Tuzla, Bosnia Herzegovina, Jun. 2014.

## Invited Speaker

- Invited Speaker/Panelist, NANONETWORKING: QUO VADIS?, IEEE International Conference on Communications (ICC), Denver, CO, USA, Jun. 2024.
- Invited Speaker, Extracellular Vesicle-based Biocommunication for Targeted Drug Delivery: Glioblastoma and Heart Failure, Sensor Tech Day, NTNU, Trondheim, Norway, Apr. 2023
- Invited Speaker, Extracellular-vesicle Mediated MC for Theranostic Applications, Workshop on Molecular, Biological, and Multi-Scale Communications (WMBMC) at Kings College, London, England, Jan. 2023.
- Invited Speaker, Multi-node Leadless Pacemakers - Design and Testing, 33rd Annual Society for Medical Innovation and Technology (SMIT) Conference, Oslo, Norway, May 2022.
- Invited Speaker, Extracellular Vesicle-based Biocommunication for Targeted Drug Delivery: Glioblastoma and Heart Failure, Sensor Tech Day, NTNU, Trondheim, Norway, Apr. 2023
- Invited Speaker, Extracellular-vesicle Mediated MC for Theranostic Applications, Workshop on Molecular, Biological, and Multi-Scale Communications (WMBMC) at Kings College, London, England, Jan. 2023.
- Invited Speaker, Multi-node Leadless Pacemakers - Design and Testing, 33rd Annual Society for Medical Innovation and Technology (SMIT) Conference, Oslo, Norway, May 2022.
- "Wireless Micro Machines for Cancer Diagnosis and Treatment", TEKNA Health Technology Conference, Gardermoen, Oct. 2021.
- "Future Wireless Implants and Data Analytics" H2020:MSCA:RISE - ROVER project Webinar, Dec. 2020.
- "Medical Device Regulatory Science (MDRS) and ROVER Workshop", The 14th IEEE International Symposium on Medical Information Communication Technology (ISMICT), Nara, Japan, May 2020.
- "Wearables, implants, artificial cells: The present and future of sensor technology and bio-monitoring", Scandinavian Association for the study of pain, Oslo, Norway, Apr. 2019.
- "Wireless Health and Care: Opportunities and Challenges", Arab-German Young Academy of Sciences and Humanities, Rabat, Morocco, Oct. 2018.
- "Robotic pill: automatic polyp detection using AI and magnetic locomotion", Cutting Edge Festival, Oslo Science Park, Norway, Sept. 2018.
- "AI for Robotic Surgery", 37 degrees C Life Science Conference, Stavanger, Norway, Jun. 2018
- "EU project WiBEC: leadless Pacemaker and Robotic pill", TEKNA Health Technology Conference, Gardermoen, Norway, Mar. 2018.
- "Sensor- and communication-technology and use of deep learning in medical care of the future", Oslo Science Park, Oslo, Norway Jan. 2018.
- "5G for Medical ICT", The 11th IEEE Int. Symposium of Medical ICT (ISMICT), Lisbon, Portugal, Feb. 2017.
- "Internet of BioNano Things for Health and Care", The E-health conference, Oslo, Norway, Apr. 2016.

- "5G for Healthcare", The 1st Nordic Conference on ICT - 5G expected impact, Oslo, Norway Apr. 2016.
- "Wearable and Implantable Sensors and Body Sensor Networks", CIMTEC Congress, Italy, Jun. 2014.
- "Brain Communication Networks", ICST/ACM International Conference of Body Area Networks (BodyNets), Boston, USA, Oct. 2013.
- "Ultra wideband technology for medicine", The 13th IEEE International Conference on Ultra Wideband (ICUWB), Sydney, Australia, Sept. 2013.
- "Self diagnostics", The E-health conference, Oslo, May, 2013.
- "Wireless medicine: brain applications", The 6th IEEE International Symposium of Medical Information and Communication Technology (ISMICT), San Diego, USA, Mar. 2012.
- "Wireless capsule endoscope", The 2nd IEEE International Workshop on Future Wellness and Medical ICT Systems, Brest France, Oct. 2011.
- "Wireless medical sensor networks: status and future challenges", The 5th IEEE Int. Symposium of Medical ICT (ISMICT), Montreux, Switzerland, Mar. 2011.

## PROFESSIONAL SERVICES

### PhD Thesis Committee/Professorship Assessment Committee

- PhD Assessment Committee Member, "Low-Power Conductive Intracardiac Communication for Leadless Multi-Chamber Pacemaker Systems", Adrian Ryser, University of Bern, Switzerland, Aug. 2024.
- PhD Assessment Committee Member, "Adaptive Impedance Matching in the Lossy Medium", Mehrab Ramzan, Technische Universitat Dresden, Germany, Jun. 2024.
- PhD Assessment Committee Member, "Electromagnetic Radiation of Implantable Antennas", Mingxiang Gao, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, Jan. 2024.
- PhD Assessment Committee Member, "Perspectives of Deep Learning for Neonatal Sepsis Detection", Antoine Honore, Royal Institute of Technology (KTH), Sweden, Aug. 2023
- PhD Assessment Committee Member, "Study of a MagnetoElectric Transducer to Wireless Power Medical Implants", Giulia Rizzo, University of Paris-Saclay, France, Dec. 2020
- External examiner/PhD defence committee, "Subcutaneous Monitoring of Cardiac Activity for Chronically Implanted Medical Devices", Rafael Cordero, University of Paris Sud, France, Jan. 2020
- Third opponent/PhD Committee, "Dynamic Channel Models for Wireless Body Area Networks", Norwegian University of Science and Technology, Gjøvik, Sep. 2018.
- External reviewer, "Qualification Assessment for Full Professor", University of Ontario Institute of Technology, Canada, Jan. 2017.
- External examiner/PhD Committee, "Ca<sup>2+</sup>-signaling-based Molecular Communication Systems Towards Nanomedicine", Michael Barros, Waterford Institute of Technology, Ireland, Mar. 2016.
- Third opponent/PhD Committee, "mm-Wave and MIMO Systems for In-door and Out-door Communications", Tommaso Cella, Norwegian University of Science and Technology, Trondheim, Sep. 2015.
- First opponent/PhD Qualifier, "Performance Monitoring and Control in Wireless Sensor Networks", Ibrahim Orhan, Royal Institute of Technology (KTH), Sweden, Jun. 2012.
- Third opponent/PhD Committee, "Interference Analysis and Management with Applications in Heterogeneous Small-cell Cognitive Radio Networks", Nurul Hoda Mahmood, Norwegian University of Science and Technology, Trondheim, Dec. 2012.

## Editorial Activities

- Specialty Chief Editor, Frontiers in Communications and Networks, 2020 - until now.
- Guest editor, "Special Issue on Molecular Communications for Diagnostics and Therapeutic Development of Infectious Diseases, IEEE Transactions on Molecular, Biological, and Multi-scale Communications, Sept. 2020
- Guest editor, "RF and Communication Technologies for Wireless IMPLANTS", IEEE J. Biomedical and Health Informatics, 2015:19(3):899-900.
- Guest editor, "Body Area Networks", Mobile Networks and Applications, 2014:19(6):683.
- Guest editor for Special Issue on Medical ICT, IEICE Transactions on Communications, Japan, 2013.
- Area editor, Elsevier J. Nano Communication Networks, 2012-until now.
- Guest editor, Internal Journal on Sensor Networks, special issue on "Recent advances in sensor integration", vol. 9. No. 1, 2011.

## Major Conference, Special Session, and Workshop Organization

- General Co-chair, 8 TH Workshop on Molecular Communications, Oslo, Norway Apr. 2024.
- General Chair, 13th IEEE Int. Symposium of Medical ICT conference, Oslo, Norway, Apr. 2019.
- Steering Committee Member, ACM NANOCOM Conference, 2018-2022.
- Panel Organizer and Moderator, "Technological Trends and Challenges for Future Healthcare", at the 13th EAI BODYNETS Conference, Oulu, Finland, Sep. 2018.
- Invited Session Organizer, "Body Sensor Network - Molecules, Radio and Machine Learning", at the 39th IEEE Engineering in Medicine and Biology Conf., Jeju Island, South Korea, Jul. 2017.
- Special Session Organizer, "Latest Advances In Radio Frequency, Molecular, And Processing Technologies For In-Body And On-Body Sensor Systems", at the 38th IEEE Engineering in Medicine and Biology Conf., Orlando, FL, USA, Aug. 2016.
- TPC Co-Chair EAI International Conference on Smart Wearable Devices and IoT for Health and Wellbeing Applications, Toronto, Canada, Oct. 2015.
- TPC Co-Chair ACM NANOCOM, Boston, USA, Sep. 2015.
- Special Session Organizer, "Latest Advances in Radio Frequency Technology for Medical Implants", at the 37th IEEE Engineering in Medicine and Biology Conf., Milan, Italy, Aug. 2015.
- Symposium Organizer, "Nanoscale and Molecular Communication Technologies for Future Healthcare" at the 36th IEEE Engineering in Medicine and Biology, Chicago, USA, Aug. 2014.
- Special Session Organizer, "Wireless Capsule Endoscopy " at the 36th IEEE Engineering in Medicine and Biology, Chicago, USA, Aug. 2014.
- Special Session Organizer, "Wireless Implants", Eight Int. Conference on Body Area Networks (BodyNets), Boston, USA, Sep., 2013.
- Member, TPC, IEEE Int. Conference on Communications (ICC), Budapest, Hungary, Jun. 2013.
- General Chair, Seventh Int. Conference on Body Area Networks (BodyNets), Oslo, Norway, Sep. 2012.
- Member, TPC, International Symposium on Applied Sciences in Biomedical and Communication Technologies (ISABEL), Barcelona, Spain, Italy, Sep. 2011.
- Member, TPC, International Symposium on Applied Sciences in Biomedical and Communication Technologies (ISABEL), Rome, Italy, Nov. 2010.
- Demo Chair, The Fifth International Conference on Body Area Networks, Greece, Sep. 2010.
- Member, TPC, 5th International ICST Conference on Communications and Networking in China, (CHINACOM), Beijing, China, Aug. 2010.
- Member, TPC, IEEE Int. Symposium of Medical ICT (ISMICT), Taipei, Taiwan, Mar. 2010.
- Member, TPC, International Symposium on Applied Sciences in Biomedical and Communication Technologies (ISABEL), Bratislava, Slovakia, Nov. 2009.

- Member, TPC, Sixth International Conference on Broadband Communications, Networks, and Systems (BROADNETS), Madrid, Spain, May 2009.
- Member, TPC, 4th International ICST Conference on Communications and Networking in China, (CHINACOM), Xian, China, Aug. 2009.
- TPC Co-Chair, 6th pHealth Workshop on Wearable Micro and. Nano Systems for Personalised Health (pHealth), Oslo, Norway, Jun. 2009.
- Member, TPC, First International Workshop on Pervasive Computing Systems and Infrastructures (PCSI), Washington DC, USA, Apr. 2009

### Grant Proposal Reviewing Activities

- Swiss National Science Foundation (SNSF), Switzerland, 2025.
- External reviewer, Research and Innovation Foundation, Cyprus, 2024.
- External reviewer, Deutsche Forschungsgemeinschaft (DFG - German Research Foundation), 2018-2019.
- External reviewer, "ERC Consolidate Grants", European Research Council, 2017-2019.
- Reviewer and panel member, Program "User-driven Research based Innovation", Research Council of Norway, 2016-2018.
- Reviewer, "Technology Program", Agencia Nacional de Evaluacion y Prospectiva (ANEP), Spain, 2016.
- Reviewer and chair of the panel, "H2020 and COST ACTIONS", European Commission, 2016.
- Reviewer, "H2020 and COST ACTIONS", European Commission, 2013-2015.
- Reviewer and panel member, "HØYKOM Research Program", Research Council of Norway, 2010.

### Manuscript Reviewer

- IEEE Transactions on Communications, IEEE Transactions on Signal Processing, IEEE Transactions on Biomedical Engineering, IEEE Journal of Biomedical and Health Informatics, IEEE Transactions on Molecular, Biological, and Multi-Scale Communications, Nano Communication Networks, IET Communications, and IET Signal Processing.

### PRIZES, AWARDS, and ACADEMY MEMBERSHIP

- **Best paper award** - M. Zoofaghari, M. Damrath, M. Veletic, and I. Balasingham. Ultrasound-enabled SIMO Channel for Targeted Brain Cancer Chemotherapy. IEEE International Conference on Communications (ICC), Denver, CO, USA, Jun. 2024. pp. 1-6.
- **Best paper award** - M. Zoofaghari, M. Damrath, M. Veletić, K. Sagini, J. Bergsland, A. Llorente, and I. Balasingham. In Silico Model for Tumor Diagnosis based on Bloodstream Penetrating Extracellular Vesicles. The 10th ACM International Conference on Nanoscale Computing and Communication (NANOCOM), Coventry, UK, Sep. 2023, pp. 1-7. (Awarded Best Paper)
- **Polyp Segmentation - First Prize**, H. Qadir, Y. Shin and I. Balasingham, at the Endoscopic Vision Challenge, 21st Int. Conference of Medical Image Computing and Computer Aided Interventions (MICCAI), Granada, Spain, Sept. 2018.
- **Polyp Detection and Localiztion Award - Third Prize**, Y. Shin, H. Qadir, and I. Balasingham, at the Endoscopic Vision Challenge, 20th Int. Conference of Medical Image Computing and Computer Aided Interventions (MICCAI), Qubec, Canada, Sept. 2017.
- **Best paper award** - A. Khaleghi, R. Chavez-Santiago, and I. Balasingham. On the Use of a Dielectric Matching Layer for Ultra Wideband Medical Applications. In the Proc. of 7th ICST/ACM Body Area Networks Conference (Bodynets), pp 1-7, Oslo, Norway, Sep. 2012
- IEEE Senior Member, 2011
- **Best paper award** - W. Leister, T. Fretland and I. Balasingham. Use of MPEG-21 for security and authentication in biomedical sensor networks In Proc. of the ICSNC, DOI: 10.1109/ICSNC.2008.24, pp 151-156, Malta, Oct. 2008.

- Personal doctoral degree scholarship from the Research Council of Norway, 1996-1998.
- Mobility scholarship to the University of Linköping by the Nordic Academy for Advanced Study, 1995.
- Master thesis scholarship to study at the University of California, Santa Barbara, USA by the Norwegian University of Science and Technology, 1992-1993.

## MAJOR CONTRIBUTIONS TO THE EARLY CAREERS OF EXCELLENT RESEARCHERS

### Postdoctoral and Research Fellows

1. A. Etemadi, Bounded Diffusion Based Molecular Communications in Vascular Networks, (2023-2025).
2. R. Laidi, Pervasive AI in Healthcare IoT (2023-2026).
3. G. S. Da Silva, Bacteria Sensing and Signaling (2022-2025).
4. A. Hasanvand, Backscatter Power and Data Transfer Systems for Brain Implants as part of Brain-Machine Interface (2022-2026).
5. N. Nesaragi, Statistical Signal Processing and Deep Learning for Vital Signs Analysis (2022 - 2027).
6. M. Damrath, Molecular Communication Theoretical Approach for Cardiac Nanonetworks, (2022-2024).
7. R. Narayanan, Core shell Nanoparticles for Sensing and Communications for Brain Applications, (2022-2024).
8. M. Zoofaghari, Communication Theoretical Foundation for Nanonetworks, (2021-2027).
9. H. Qadir, AI for Medical Data, (2020-until now).
10. P. Bose, Simultaneous Wireless Data and Power Transfer, (2020-2024).
11. S. Srikumar, Magnetic-piezo Nano Particles, (2020-2022).
12. H. Arjmandi, Cardiomyocytes communications, (2019-2022).
13. A. Jannesari, Implantable Communication Systems, (2019-2021).
14. A. Maghoul, Gold Nano Particles and Biophoton, (2019-2021).
15. N. El-Ganainy, Online Learning Networks for Sensor Data (2018-2021).
16. M. Veletic, Molecular Communications (2017-2022).
17. A. Khaleghi, Backscatter communications for implants (2015-2023)
18. N. Islam, Neuronal Nanonetworks (2016-2017).
19. A. Chelli, Machine learning for energy and comfort optimization (2016-2017).
20. Y. Shin, Machine learning for polyp detection (2016-2019).
21. J. F. M. Medina, Machine learning for energy efficient home automation (2014-2015).
22. M. Bagaa, Communication strategies for energy harvesting sensor networks (2015-2016).
23. R. Chandra, Localization and tracking wireless capsule endoscope (2014-2015).
24. F. Mesiti, Capacity on nano communication networks (2014-2015).
25. R. Chavez-Santiago, UWB networks (2009-2015).
26. P. A. Floor, Signal processing for robust communications (2014-2015).
27. R. Komuro, Mathematical modeling of electromagnetic induced neuronal network (2012-2013).
28. F. Gao, Mathematical analysis on bio-inspired communication network theory (2011-2012).
29. A. Jabbari, Nano communication network design (2011-.2012).
30. F. Mesiti, Nano communication network theory (2011-2012).
31. A. N. Kim, Joint source-channel coding and modulation (2011-2012).

32. S-S. Byun, Cognitive wireless networks (2007-2011).
33. Q. Wang, UWB localization and MELODY network prototype (2010-2011).
34. A. C. Gordillo, UWB for medical sensing (2009-2010).
35. J. Ding, Management of sensor networks (2009).
36. D. Djenouri, Localization based routing and network protocol (2008-2009).
37. A. Khaleghi, Distributed signal processing in sensor network (2008-2009).
38. P. Mirtaheiri, Multifunctional sensors (2006-2007).
39. M. El Ansari, 2D-3D Registration of MR Images (2003).

## PhD Students

1. A. Vestengen, Explainable AI for Multimodal Data (funded by Health Trust South-East of Norway, Main Supervisor, 2024 - 2027)
2. N. Kumar, Prognostication of Survival in Multimodal Treatments for Liver Metastases using Multimodal Data Analytics (funded by Health Trust South-East of Norway, Main Supervisor, 2023 - 2026)
3. F. Anderl, Quorum Sensing Molecular Communications Bacterial Detection, (2021-2025).
4. M. Lekic, Extra-cellular Vesicle Communications for Brain Cancer Therapy, (2021-2025).
5. M. Mahootiha, Development of a Multimodal Artificial Intelligence Framework for Cancer Prognosis (Graduated 2025).
6. H. K. Rudsari, Modeling Aspects of the Extracellular Vesicle-mediated Bio-nano Communication for Medical Applications (Graduated 2023).
7. R. Noormohammadi, On the Ultra-low-power Wireless Communication Methods for Biomedical Implants (Graduated 2023).
8. M. Albatat, Optimal Pacing Sites in Cardiac Resynchronization Therapy (Graduated 2023).
9. P. Lu, Molecular channel modeling for heart resynchronization (Graduated 2021).
10. F. Awan, Physical Layer Security for In-Body Wireless Cardiac Sensor Network (Graduated 2020).
11. H. Qadir, Development of Image Processing Algorithms for the Automatic Screening of Colon Cancer Based on Video Capture (Graduated 2020).
12. P. Bose, Communication and Signal Transmission for In-body Sensor Networks (Graduated 2019).
13. H. Fouladi, On Signal Recovery: Independent Component Analysis for Multiple Measurement Vectors and Source Separation (Graduated 2018).
14. K. Habib, Context-Aware Authentication for the IoT in eHealth, (Graduated 2018).
15. M. Veletic, On the Neural Communication for Data Transmission in Nano-Networks, (Graduated 2017).
16. L-E. Solberg, Radar based central blood pressure estimation (Graduated 2016).
17. K. Øyri, Feasibility of short-range wireless monitoring in critical environments, (Graduated 2015).
18. F. Kazemeyni, Collaborative wireless sensor networks (WSN): modeling and analysis, (Graduated 2013).
19. B. Moussakhani, On Localization and tracking for WCE, (Graduated 2013).
20. T. H. Nguyen, Power efficient communication for medical WSN, (Graduated 2013).
21. H. Moussavinik, On narrowband interference mitigation methods for robust WSNs, (Graduated 2013).
22. S. Støa, WSNs for medical applications, (Graduated 2012).
23. X. Liang, QoS provisioning for WSNs: algorithms, protocols and modeling, (Graduated 2009).

## Research Engineers

1. N. Gnanakulasekaran, Embedded Systems for Medical Implants, (2020-2022).
2. J. S. Ortiz Hansen, Deep learning networks for video processing, (2019-2022).
3. O. Ievglevskiy , Electrophysiology for cardiomyocytes and neurons, (2019-2021).

## MSc Thesis Supervision

1. Z. Gondal, Design and Analysis of a Novel Spiking Neural Network Hardware Accelerator, M. Sc. thesis, NTNU, 2025.
2. U. Espinoza, Multi-Modal Integration of RNA-seq and MRI to Evaluate Exosome-Based Regenerative Therapies for Myocardial Infarction, M. Sc. thesis, NTNU, 2025.
3. L. C. Middelthon, Synthetic Biocommunication Dynamics Through Time-Harmonic Electromagnetic Fields, M. Sc. thesis, NTNU, 2025.
4. T. Bruflot, A Deep Dive Into Spiking Neural Networks - Effects of fixed point quantization on ASIC design of a Spiking Neural Network for image classification, M. Sc. thesis, NTNU, 2024.
5. J. C. Isaksen, Interface Requirements for Neuromorphic Coprocessors in Embedded Systems - Design and study of an interface for integrating tinyODIN as a coprocessor in a SoC, M. Sc. thesis, NTNU, 2024.
6. S. Olsen, Exploring possibilities on predicting subjective evaluation of athlete's feelings after workout sessions using deep learning, M. Sc. thesis, NTNU, 2024.
7. M. R. Haugland, Deep Learning for Polyp Detection from Synthetic Narrow-Band Imaging, M. Sc. thesis, NTNU, 2022.
8. S. H. Ødegård, Wireless Video Capsule Endoscopy Prototype Utilizing a Backscatter Transceiver for High Data Rate Transmission, M.Sc. thesis, NTNU, 2022
9. E. Stenwig, Cellular Response analysis for Neural Prosthesis, M.Sc. thesis, NTNU, 2019
10. T-E. Rødberg, Developint Real-Time Automatic Poly Detection using Deep-CNN, M.Sc. thesis, NTNU, 2019
11. V. H. Acevedo Donato, Cardiomyocyte-driven Intra-body Communication System, M.Sc. thesis, NTNU, 2019
12. M. Falck, Machine Learning of Circulatory Oscillations in Cardiac Surgical Patients, 2016.
13. E. U. Thodesen, Diffusion-based Molecular Communications in Wireless Pacemakers, 2016.
14. K. L. Stenerud, Analysis of Low Frequency Content from the Circulatory System, 2016.
15. E. V. Bø, Wireless Capsule Endoscopy, 2016.
16. A. Bjørnevik, Localization and Tracking of Intestinal Paths for Wireless Capsule Endoscopy, 2015.
17. R. Svensrud, Remotely estimating vital signs from ambient-light photoplethysmography, 2013.
18. N. Roald, Estimation of vital signs from ambient-light non-contact photoplethysmography, 2013.
19. Å. Rostand, Estimation of pulse, heart rate, and differential blood pressure using the photoplethysmography and independent component analysis, 2012.
20. G. Vartdal, Automatic searching for Doppler spectrum, 2010 (co-supervisor);
21. M. Falch, Software algorithm for reduction of speckle noise in medical ultrasound imaging, 2010.
22. J. Grythe, Improving elastography using SURF imaging for suppression of reverberations, 2010 (co-supervisor).
23. C. S. G. Perera, Multiple Sensor Data Analysis, Fusion, and Communication for ULTRASPONDER, 2009.
24. C. Ø. Simpson, Objective Image Quality Metrics for Ultrasound Imaging, 2008, (co-supervisor).
25. S. Kvålen, Speckle tracking in IQ data, 2008, (co-supervisor).
26. K. Stallemo, Patient friendly presentation of electronic patient record, 2008, (co-supervisor).
27. J. Mylvaganam, Characterization of medical piezoelectric ultrasound transducers using pulse echo methods, 2007, (co-supervisor).

28. E-A. Marthinsen, Detection and imaging contrast bobbles at high frequency, 2007, (co-supervisor).
29. M. Hansen & K. Ødegaard, Detection of myocardium ischemia using 3D accelerometer, 2007.
30. H. Lande, UWB-IR for biomedical sensor network, 2007.
31. Ø. Asphjell, Hybrid transceivers for Ultra Wideband Impulse Radio and the IEEE 802.15.4 in Medical Sensor Networks, 2007.
32. L. T. Vo, An optimized cross-layer protocol for patient confined wireless networks, 2007.
33. S. Djupedal, Joint Source-Channel Coding of 2D Signals, 2007.
34. M. S. Hansen & S. Støa, Practical Evaluation of IEEE 802.15.4/ZigBee Medical Sensor Networks, 2006.
35. E. Ivanova, Automatic Adaptation of Information in Electronic Patient Records for Patients, 2006, (co-supervisor).
36. F. de Vibe, Development of Roaming Real time Patient Monitor, 2005.
37. T. Skogstad, Real time 3D Video Coding, 2003.
38. M. Landem, Multimedia Electronic Patient Database, 2003.
39. Ø S. Mikkelsen, Synchronization in OFDM System, 1997.
40. M. Knoch, Design of OFDM systems based on cosine-modulated filter banks, 1997.
41. A. Bjørsvik, Comparison of filter banks in terms of image compression artifacts, 1997.
42. P. Yahampath, Hybrid coding of videophone images with model based and waveform based coding, 1995 (co-supervisor).

## VISITING SCHOLARS

1. E.Shitiri, MSCA Postdoctoral Fellowr, Universitat Politècnica de Catalunya, Spain, May - Jul. 2025
2. S. Chatterjee, Professor, Royal Institute of Technology (KTH), Stockholm, Sweden, Jan. - Dec. 2025
3. M. Tharmakulasingam, Lecturer, University of Jaffna, Sri Lanka, Apr. - May 2024
4. S. Jean-Mactoux, MSc student, Centrale Supélec, Université Paris-Saclay, France, Feb - Aug. 2024
5. A. Taparugssanagorn, Professor, Asian Institute of Technology, Thailand, May 2022
6. J. Wisanmongkol, PhD Fellow, Asian Institute of Technology, Thailand, May 2022
7. F. Pappalardo, PhD Fellow, University of Catania, Italy, Mar - Sept. 2022
8. G. Rizzo, PhD Fellow, ValoTec, France, Oct-Nov, 2019
9. Y. Zhou, Associate Professor, Shaanxi Normal University, Xian, China, Jun 2019 - Jun 2020
10. M. Ramzan, PhD Fellow, Technical University of Dresden, Germany, Apr-Jun, 2019
11. M. Maldari, PhD Fellow, Microport, France, Mar-Apr, 2019
12. S. P. Simbor, PhD Fellow, Universitat Politècnica de Valencia, Spain, Aug-Dec, 2018
13. A. N. Heredia, PhD Fellow, University of Valencia, Spain, Mar-Apr, 2018
14. B. D. Unluturk, PhD student, Georgia Institute of Technology, USA, May-Jul. 2016
15. T. Aoyagi, Associate Professor, Tokyo Institute of Technology, Japan, Nov. 2015 - Mar. 2016
16. Y. Chahibi, PhD student, Georgia Institute of Technology, USA, Jan-Nov, 2015
17. A. Secerbegovic, PhD student, University of Tuzla, Bosnia-Herzegovina, Feb. 2015
18. C. Garci- Prado, Postdoctoral Fellow, Universitat Politècnica de Valencia, Spain, Oct-Nov, 2014
19. F. L. Garcia, PhD student, University of Cordoba, Spain, Aug-Oct, 2014, Aug-Sept, 2015
20. R. M. Narayanan, Professor, Penn State, USA, Jul-Aug, 2014
21. H. Zhou, PhD student, Penn State, USA, Jun-Aug, 2014

22. J. Palomares, Professor, University of Cordoba, Spain, May, 2014 and July, 2015
23. S. Fraedrich, MSc. student, Technical University of Dresden, Germany, 2013
24. Dainius Jankunas, PhD student, Vilnius University, Lithuania, 2012
25. D. Anzai, Assistant Professor, Nagoya Institute of Technology, Japan, 2012
26. J. Abraham, MSc. student, Technical University of Dresden, Germany, 2012/2013
27. A. Khaleghi, Associate Professor, K.N. Toosi University of Technology, Iran, 2011, 2012, 2013, 2014, 2015.
28. K. Takizawa, Researcher, National Institute of Information and Communication Technology (NICT), Japan, Jun.-Aug. 2011.
29. H. Cao, MSc student, University of British Columbia, Canada. Mar-May 2010.
30. D. Turgis, PhD student, Katholieke Universiteit Leuven, Belgium, 2008.

## PATENTS

- A. Khaleghi and I. Balasingham, On-body antenna for wireless communication of medical implant, GB1913086.3, 2019
- A. Khaleghi and I. Balasingham, System for communication among multi-chambers leadless pace-maker devices, NO20191090, 2019
- A. Khaleghi and I. Balasingham, Implantable Antenna, 136303 62159 - 17139, 2018
- A. Khaleghi, I. Balasingham, and J. Bergsland, Medical Implant with Wireless Communication, 62201-15239-GB-1, 2016.
- A. N. Kim, T. A. Ramstad, and I. Balasingham. Very Low Complexity Low Rate Image Coding for the Wireless Endoscope, US 61/717,963, 2012
- R. Chavez-Santiago, J. Bergsland, and I. Balasingham. Camera pill, GB 1220466.5, 2012

## CITATION INFORMATION

See <https://scholar.google.com/citations?user=CynghwgAAAAJ&hl=no>

- Total citations: 8883. H-index: 46. i10-index: 160.

## JOURNAL PAPERS

- [1] M. Zoofaghari, L. C. Middelthon, M. Veletic, and I. Balasingham. Electrophoretic Beam Steering in Molecular Communication: Toward Targeted Extracellular Vesicle Delivery. *Nano Communication Networks*. 2026 (in press).
- [2] F. N. Anderl, M. Veletic, and I. Balasingham. Bayesian Filtering of Biochemical Analyte Dynamics with Bacterial Sensors. *IEEE Sensors*, 2025 (in press).
- [3] O. Pabst, C. Schülke, I. Balasingham, S. Krauss, J. C. Glover, and Ø. G. Martinsen. Recording and modeling of pinched hysteresis loops, the fingerprint of a memristor, in neurons. *Scientific Reports*, 2025;15:37212.
- [4] M. Lekic, M. Zoofaghari, I. Balasingham, and M. Veletic. On Drug Delivery System Parameter Optimisation via Semantic Information Theory. *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, 2025 (in press).
- [5] A. Etemadi, M. Damrath, and I. Balasingham. ODDM(A): A Novel Multiplexing/Multiple-access Technique for Molecular Communication Systems. *IEEE Wireless Communication Letters*, 2025;14(10):3034-3038.
- [6] R. Laidi, N. Merabtine, D. Djenouri, S. Latif, H. A. Qadir, Y. Djenouri, and I. Balasingham. Federated Learning in IoT Environments: Examining the Three-way See-saw for Privacy, Model-Performance, and Network-Efficiency. *IEEE Communications Surveys and Tutorials*, 2025 (in press).

- [7] A. Etemadi, M. Damrath, M. Veletic, and I. Balasingham. Modulation over Diffusion Domain: A Proof-of-Concept for Cellular Sensing Mechanisms. *IEEE Transactions on Communications*, 2025;75(10):8704-8719.
- [8] M. Zoofaghari, K. Sagini, M. Damrath, A. Zargarnia, H. Flaten, M. Veletić, A. L. Martinez, and I. Balasingham. In silico Study of Bloodstream Penetrating Extracellular Vesicles. *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, 2025;11(2):166-175.
- [9] M. Zoofaghari, M. Damratha, M. Veletic, and I. Balasingham. Empirical Model of Focused Ultrasound-mediated Treatment for Chemotherapy Delivery to Brain Tumors. *Ultrasound in Medicine and Biology*. 2025 May;51(5):877-883.
- [10] M. Lekic, M. Veletic, M. Damrath, M. Zoofaghari, and I. Balasingham. Modulating Tumor Cell Extracellular Vesicle Signaling for Therapeutic Intervention and Monitoring. *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, 2025;11(1):51-65.
- [11] M. Mahootiha, D. Tak, Z. Ye, A. Zapaischykova, J. Likitlersuang, J. C. C. Pardo, A. Boyd, S. Vajapeyam, R. Chopra, S. Prabhu, K. X. Liu, H. Elhalawani, A. Nabavidazeh, A. Familiar, S. Mueller, H. J.W.L. Aerts, P. Bandopadhyay, K. Ligon, D. Haas-Kogan, T. Poussaint, H. A. Qadir, I. Balasingham, and B. H. Kann. Multimodal Deep Learning Improves Recurrence Risk Prediction in Pediatric Low-Grade Gliomas. *Neuro-Oncology*, 2025 Jan 12;27(1):277-290.
- [12] H. K. Rudsari, M. Damrath, M. Zoofaghari, I. Balasingham, and M. Veletic. An Intercellular Communication System for Intra-Body Communication Networks. *IEEE Transactions on Communications*, 2025;73(2):817-831.
- [13] F. N. Anderl, G. Salvadori, M. Veletic, F. C. Petersen, and I. Balasingham. Quantitative Aspects, Engineering and Optimization of Bacterial Sensor Systems. *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, 2024;10(4):517-533.
- [14] V. Nainamalai, H. A. Qair, E. Pelanis, H. B. Jenssen, Å. A. Fretland, B. Edwin, O. J. Elle, and I. Balasingham. Automated algorithm for medical data structuring, and segmentation using artificial intelligence within secured environment for dataset creation. *European Journal of Radiology Open*, 2024;13, p.100582.
- [15] S. Logotheti, A. Pavlopoulou, H. K. Rudsari, A-M. Galow, Y. Kafali, E. Kyrodimos, A. I. Giotakis, S. Marquardt, A. Velalopoulou, I. I Verginadis, C. Koumenis, T. Stiewe, J. Zoidakis, I. Balasingham, R. David, A. G Georgakilas. Intercellular pathways of cancer treatment-related cardiotoxicity and their therapeutic implications: The paradigm of radiotherapy. *Pharmacol Ther.* 2024 May 30;108670. doi: 10.1016/j.pharmthera.2024.108670. Epub ahead of print. PMID: 38823489.
- [16] M. Li, A. Khaleghi, A. Hasanvand, R. P. Narayanan, and I. Balasingham. A New Design and Analysis for Metasurface-Based Near-field Magnetic Wireless Power Transfer for Deep Implants. *IEEE Transactions on Power Electronics*, 2024;39(5):6442 - 6454.
- [17] M. Mahootiha, H. A. Qadir, D. Aghaya, Å. A. Fretland, B. v. G. Edwin, and I. Balasingham. Deep learning-assisted survival prognosis in renal cancer: A CT scan-based personalized approach. *Heliyon*, 2024;10:e24374:1-15.
- [18] R. P. Narayanan, A. Khaleghi, M. Veletić, and I. Balasingham. Multiphysics simulation of magnetoelectric micro core-shells for wireless cellular stimulation therapy via magnetic temporal interference. *PLOS ONE* 2014;19(1): e0297114. <https://doi.org/10.1371/journal.pone.0297114>
- [19] M. Mahootiha, H. A. Qadir, J. Bergsland, and I. Balasingham. Multimodal deep learning for personalized renal cell carcinoma prognosis: Integrating CT imaging and clinical data. *Computer Methods and Programs in Biomedicine*, 2024;244 (107978):1-14.
- [20] M. Damrath, M. Veletic, H. K. Rudsari, and I. Balasingham. Optimization of Extracellular Vesicle Release for Targeted Drug Delivery. *IEEE Transactions on Nanobioscience*, 2024;3(1):109-117.
- [21] M. Zoofaghari, F. Pappalardo, M. Damrath, and I. Balasingham. Modeling Extracellular Vesicles-Mediated Interactions of Cells in the Tumor Microenvironment. *IEEE Transactions on Nanobioscience*, 2024;23(1):71-80.
- [22] N. Nesaragi, L. Ø. Høiseth, H. A. Qadir, L. A. Rosseland, P. S. Halvorsen, and I. Balasingham. Non-invasive Waveform Analysis for Emergency Triage via Simulated Hemorrhage: An Experimental Study using Novel Dynamic Lower Body Negative Pressure Model. *Biocybernetics and Biomedical Engineering*, 2023;43(3):551-567.

- [23] M. Damrath, M. Zoofaghari, M. Lekic, H. K. Rudsari, F. Pappalardo, M. Veletic, and I. Balasingham. Computational Estimation of Chemical Reaction Rates in Extracellular Vesicle Signaling. Elsevier Nano Communication Networks, 2023;37:100455:1-10.
- [24] R. Noormohammadi, A. Khaleghi, and I. Balasingham. Analog Backscatter Video Transmission for Wireless Capsule Endoscope. IEEE Access, 2023;11:18542 - 18550.
- [25] H. K. Rudsari, M. Zoofaghari, M. Damrath, M. Veletic, J. Bergsland, and I. Balasingham. Anomalous Diffusion of Extracellular Vesicles in an Extracellular Matrix for Molecular Communication. IEEE Transactions on Molecular, Biological, and Multi-Scale Communications, 2023;9(1):8 - 12.
- [26] H. K. Rudsari, M. Zoofaghari, M. Veletic, J. Bergsland, and I. Balasingham. The End-to-End Molecular Communication Model of Extracellular Vesicle-based Drug Delivery. IEEE Transactions on Nanobioscience, 2023;22(3):498-510.
- [27] M. Albatat, H. N. Finsberg, H. Arevalo, J. Sundnes, J. Bergsland, I. Balasingham, and H. H. Odland. Regional Left Ventricular Fiber Stress Analysis for Cardiac Resynchronization Therapy Response. Annals of Biomedical Engineering, 2022;51:343 - 351.
- [28] F. Hejri, M. Veletic, I. Balasingham, and P. A. Hoeher. Pace Time Modulation for Intra-Cardiac Communication. IEEE Communications Letters, 2022;26(10):2385 - 2389.
- [29] M. Veletic, E. H. Apu, M. Simic, J. Bergsland, I. Balasingham, C. H. Contag, and N. Ashammakhi. Implants with Sensing Capabilities. ACS Chemical Reviews, 2022;122(21):16329 - 16363.
- [30] F. R. Rostami, A. Khaleghi, and I. Balasingham. Computer Simulation of Magnetoelectric Antenna and Performance Comparison With Micro-Loop. IEEE Access, 2022;10:64473 -64482.
- [31] E. H. Apu, Md. Nafujjamana, S. Sandeep, A. Ashley, V. Makela, A. Khaleghi, S. Vainio, C. H. Contag, J. Li, I. Balasingham, T. Kim, and N. Ashammakhi. Biomedical applications of multi-functional magnetoelectric nanoparticles. Materials Chemistry Frontiers, 2022;6:1368-1390.
- [32] L. Amirifar, A. Shamloo, R. Nasiri, N. R. de Barros, Z. Z. Wang, B. D. Unluturk, A. Libanori, O. Ievglevskyi, S. E. Diltemiz, S. Sances, I. Balasingham, S. K. Seidlits, and N. Ashammakhi. Brain-on-a-chip: Recent advances in design and techniques for microfluidic models of the brain in health and disease. Biomaterials, 2022;285:121531.
- [33] A. Maghoul, A. Rostami, M. Veletic, B. D. Unluturk, N. Gnanakulasekaran, and I. Balasingham. Optical Modelling and Characterization of Demyelinated Nerve Using Graphene-Based Photonic Structure. IEEE Access, 2022;10:28792 - 28807.
- [34] S. Mahmood, S. Schostek, M. O. Schurr, J. Bergsland, I. Balasingham and E. Fosse. Robot-assisted magnetic capsule endoscopy; navigating colorectal inclinations. Minimally Invasive Therapy & Allied Technologies, 2022 Aug;31(6):930-938.
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- [37] H. A. Qadir, I. Balasingham, and Y. Shin. Simple U-net based synthetic polyp image generation: Polyp to negative and negative to polyp. Biomedical Signal Processing and Control. Volume 74, April 2022, 103491.
- [38] M. Zoofaghari, A. Etemadi, H. Arjmandi, and I. Balasingham. Modeling Molecular Communication Channel in the Biological Sphere With Arbitrary Homogeneous Boundary Conditions. IEEE Wireless Communications Letters, 2021;10(12):2786-2790.
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- [41] E. Ural, V. Toomajian, E. H. Apu, M. Veletic, I. Balasingham, N. Ashammakhi, M. Kanada, and C. H. Contag. Visualizing Extracellular Vesicles and Their Function in 3D Tumor Microenvironment Models. *Int. J. Mol. Sci.* 2021, 22(9), 4784.
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- [44] M. T. Barros, M. Veletic, M. Kanada, M. Pierobon, S. Vainio, I. Balasingham, and S. Balasubramaniam. Molecular Communications in Viral Infections Research: Modelling, Experimental Data and Future Directions. *IEEE Transactions on Molecular, Biological and Multi-scale Communications*, 2021;7(3):121-141.
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