

# CURRICULUM VITAE

## I. BIOGRAPHICAL DATA

Edward Joseph Vigmond  
Citizenship: Canadian

IHU Liryc  
Hôpital Xavier Arnoz  
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## II. PROFESSIONAL RECORD

### A. Academic Record

#### *i) Undergraduate*

B.A.Sc., 04/1988  
Electrical and Computer Engineering  
University of Toronto/Toronto/Canada

#### *ii) Graduate*

M.A.Sc., 04/1991  
Electrical and Computer Engineering, Institute of Biomedical Engineering  
University of Toronto/Toronto/Canada

Ph.D., 01/1997

Electrical and Computer Engineering, Institute of Biomedical Engineering  
University of Toronto/Toronto/Canada

Diplôme d'Habilitation à Diriger Des Recherches, 01/2017

Université de Bordeaux/Bordeaux/France

#### *iii) Post-doctoral or other special training*

- Postdoctoral Fellow, 06/1997–07/1999  
Biomedical Engineering  
Institut de génie biomédical/Université de Montréal/Montreal/Canada  
*Supervisor:* Dr. L. Josh Leon
- Postdoctoral Fellow, 08/1999–06/2001  
Biomedical Engineering  
Department of Biomedical Engineering, Tulane University/New Orleans/U.S.A  
*Supervisor:* Dr. Natalia A. Trayanova

### B. Academic and Other Appointments

- Researcher, [L'Institut Rythmologie et Modelisation Cardiaque \(Liryc\)](#), Université de Bordeaux, 1/2012–present

- Associate Professor, University of Calgary, 07/2005–11/2011
- Assistant Professor, University of Calgary, 07/2001–06/2005

### C. Administrative Responsibilities

- Head of Modelling Team, LIRYC Institute, 1/2012–present
- Associate Director for the Biomedical Engineering Undergraduate Specialization, 01/2008–8/2009
- Director, Center for BioEngineering Research and Education, 01/2009–11/2011

### D. Professional Certification and Memberships in Learned Societies

- Professional Engineer, APEGGA, January 2003–Nov 2011
- Member, IEEE Engineering in Medicine and Biology, 1998–present
- Member, Libin Cardiovascular Institute, University of Calgary, 2005–2011.

### E. Awards, Distinctions, and Fellowships

International Congress on Electrocardiography Young Investigator Award	2003
NSERC Postdoctoral Fellowship	1997-99
IEEE EMBS Whitaker Student Paper Region 7 Finalist	1996
N.F. Moody Award	1996
Ontario Graduate Scholarship	1993–94
University of Toronto Open Scholarship	1992–93
Ontario Graduate Scholarship	1991–92
NSERC Post-Graduate Scholarship	1988–90
Gordon F. Tracy Scholarship	1987-88
John M. Empey Award	1986-87
University of Toronto Admission Scholarship	1984-85

## III. EDUCATIONAL ACTIVITIES

### A. Instruction

#### *Undergraduate Level Instruction*

- Introduction to Circuits/ENEL341, Fall 2006, lecture/lab/tutorial
- Bioelectricity/BMEN409, Winter 2006–9,2011 lecture/lab/tutorial
- Circuits for Software Engineers/ENEL329, Fall 2005, lecture/tutorial
- Programming Fundamentals/ENCM339, Fall 2003 and 2004, lecture/lab/tutorial
- Software Engineering for Computer Engineers/ENCM493, Winter 2003 and 2004, lecture/lab/tutorial
- Biomedical Signal Analysis/ENEL563, Fall 2001,2&7 lecture/lab/tutorial
- Signals and Systems/ENEL327, Winter 2001, lecture/lab/tutorial
- Numerical Methods in Engineering, ENGG407, Fall 2009, lecture/tutorial

- Tulane University, New Orleans, U.S.A: Topics in Excitable Media/BMEN 676, graduate/undergraduate, Winter 2001, lecture

#### *Graduate Level Instruction*

- Numerical Electromagnetic Field Computation/ENEL663(was 619.09), Fall 2002/4/6/9, lecture
- Bioelectromagnetism/ENEL(was 619.21), Fall 2003/5/7, W2011 lecture
- Frontiers in Biomedical Engineering/ENME619.81, Winter 2002 & Fall 2003, course coordinator
- Fundamentals of Biomedical Engineering ENBM 601, Fall 2004, guest lecture

## **B. Graduate and Undergraduate Supervision**

#### *Current Graduate Students*

1. Seyedhamed Hosseini, Supervisor, IMB, Ph.D., 10/2023–9/2026 Thesis Title: *Digital Twin for Atrial Fibrillation*.

#### *Past-Supervised Graduate Students*

1. Yingjing Feng, Supervisor, IMB, Ph.D., 5/2018–4/2021 Thesis Title: *Machine Learning for Atrial Fibrillation*.
2. Jaspreet Kaur, Supervisor, Electrical and Computer Engineering, Ph.D., 9/2010–10/2017 Thesis title: *Computational Modelling of Electrical Cell-to-Cell Interactions in Cardiac Tissue: Applications to Model Parameter Selection and Pacemaker Function*
3. Elham Behradfar, Supervisor, Electrical and Computer Engineering, Ph.D., 9/2010–3/2016, Thesis title: *Purkinje System Ca-induced Arrhythmogenesis*
4. Kamran Bigdeley-Shamloo, Supervisor, Electrical and Computer Engineering, M.Sc., 9/2009–9/2012, Thesis title: *Modeling a Novel Mechanism of Calcium-Induced Calcium Release in Vascular Smooth Muscle Cell*
5. Neal Gallagher, Supervisor, Electrical and Computer Engineering, M.Sc., 9/2009–8/2012, Thesis: *Radio-Frequency Catheter Ablation for Treatment of Atrial Fibrillation: The Influence of Probe Contact Geometry on Lesion Formation*
6. Yves Pauchard, Supervisor, Electrical and Computer Engineering, Ph.D., 9/2007–1/2012 Thesis title: *In Vivo Monitoring of Longitudinal Changes in Bone Architecture Using High-Resolution Peripheral Computed Tomography*
7. Patrick Boyle, Supervisor, Electrical and Computer Engineering, Ph.D., 9/2005–8/2011 Thesis title: *Role of the Purkinje System During Electric Shocks and Arrhythmia*
8. Go Suzuki, Supervisor, Electrical and Computer Engineering, M.Sc., 9/2006–12/2009, Thesis: *Disorganization in ICD Electrograms*
9. Mauricio Munoz, Supervisor, Electrical and Computer Engineering, M.Sc., 9/2005–4/2009 Thesis title: *Onset of Atrial Arrhythmias by Autonomic Neural Stimulation and their Termination - A Simulation Study*

10. Makarand Deo, Supervisor, Electrical and Computer Engineering, Ph.D., 1/2004–9/2008 Thesis title: *Modeling the Role of the Purkinje System in Cardiac Arrhythmias*
11. Mark Ridler, Supervisor, Electrical and Computer Engineering, M.Sc., 9/2004–6/2007 Thesis title: *Arrhythmogenic Consequences of Action Potential Duration Gradients in the Atria*
12. Hai Kim Diep, Supervisor, Electrical and Computer Engineering, M.Sc., 9/2002–11/2005, Thesis title: *Modelling Electrical Communication in a Resistance Artery*
13. Naresh Bajaj, Supervisor, Electrical and Computer Engineering, M.Sc., 9/2002–8/2005, Thesis title: *Quantification of Organization in ICD Electrograms*
14. Vincent Tsoi, Supervisor, Electrical and Computer Engineering, M.Sc., 9/2002–10/2004, Thesis title: *Vagal Effects on Atrial Arrhythmogenesis*

#### *Visiting Graduate students*

- Niccolò Biasi, University of Pisa, 1/2023–4/2023
- Matthias Gsell, Medical University of Graz, 7/2022
- Karli Gilette, Medical University of Graz, 9/2019–2/2020
- Marina Strocchi, King's College London, 2/2020
- Jorge Sanchez, Karlsruhe Institute of Technology, 4/2018

#### *Senior Undergraduate students*

- William Francheschi, Johns Hopkins University, 5/2017–8/2017
- Claudia Hawkes, University of Navarra, 5/2017–8/2017
- Paul Cole, Electrical and Computer Engineering, University of Calgary, 5/2011–9/2011, NSERC USRA
- Aron Su, Software Engineering, University of Calgary, 9/2010–12/2010, 4th year project
- Adarsh Madhavan, Electrical and Computer Engineering, University of Calgary, 5/2010–9/2010, NSERC USRA
- Gio DiFrancesco, Software Engineering, University of Calgary, 9/2009–4/2010, 4th year project
- Mike Lee, Electrical and Computer Engineering, University of Calgary, 5/2007–9/2007, NSERC USRA
- Sean Gifford, Electrical and Computer Engineering, University of Calgary, 5/2005–9/2005, NSERC USRA
- Jordan Choi, Electrical and Computer Engineering, University of Calgary, 5/2004–9/2004, NSERC USRA *Threaded Data Reader C++ Class for Visualization Tool*
- Kelvin Mok, Electrical and Computer Engineering, University of Calgary, 9/2003–4/2003, B.Sc. *A Visualization Tool for Electrophysiology Simulations of the Atria*
- Fourth Year Design Project, *Biomedical Visualization Tool*, 9/2003–4/2004

- Fourth Year Design Project, *Automatic GUI Generator*, 9/2003-4/2004
- Deborah Tang, Electrical and Computer Engineering, University of Calgary, 5/2002–8/2002, Research Assistantship
- Rachel Ruckdeschel, Biomedical Engineering, Tulane University, 9/2000–4/2001, 4<sup>th</sup> year thesis, B.Sc., *Reentry in a Geometrically Accurate Model of the Atria*

### C. Postdoctoral Fellow Trainees

1. Dr. Jafar Moradicheghamah, *Stretch-induced ischemic arrhythmias*, 03/2024-02/2027
2. Dr. Fakhrieddine Bader, *High Resolution Atrial Models*, 02/2024-09/2024
3. Dr. Masimba Namaire, *Torso recordings of micro-anatomical reentries*, 05/2023-04/26
4. Dr. Alireza Kazemi, *High Resolution Modelling of AF Substrates*, 10/2022-12/22
5. Dr. Argyrios Petras, *Electromechanical arrhythmia*, 09/2019-08/2021
6. Dr. Jairo Padilla, *Electrogram Computation*, 6/2018-05/2020
7. Dr. Julien Bouyssier, *Cardiac Resynchronization Therapy*, 1/2018-12/2019
8. Dr. Peter Langfield, *Repolarization Abnormalities*, 10/2017-8/2021
9. Dr. Mirabeau Saha, *Atrial Arrhythmias*, 02/2017-01/2019
10. Dr. Namit Gaur, *Ionic modelling*, 09/2016-12/2019
11. Dr. Jaun Gomez, *Electrical Cardiac Resynchronization Therapy*, 05/2016-09/2017
12. Dr. Caroline Roney, *Atrial Electrophysiological Modelling*, 05/2015-08/2017
13. Dr. Ali Pashei, *Cardiac Electrophysiological Modelling*, 04/2014-06/2016
14. Dr. Jason Bayer, *Cardiac Electrophysiological Modelling*, 03/2013-08/2016
15. Dr. Martin Bishop, *Effect of Blood Vessels on Defibrillation Shocks*, May-July, 2009
16. Dr. Rafael Sebastian, *Parameter Sensitivity in Solving the Bidomain Equations*, March, 2007
17. Dr. Clyde Clements, *Modeling of Cardiac Mechano-Electrical Activity*, 1/01/04-01/03/06
18. Dr. Gernot Plank, *Modeling of Cardiac Electrical Activity*, 9/02-4/03

## IV. SCHOLARLY ACTIVITIES

### A. Research Support

1. Leducq Transatlantic Network of Excellence, 2024–28, €6M, *Bioelectronics for Neurocardiology-Diagnosis & Therapeutics*, Co-Investigator.
2. ERA-PERMED, 2023–6, 990k€, *Digital Twins to Treat Atrial Fibrillation (DAWN-AF)*, Project Coordinator.

3. ANR Generic Call, 2023-2026, 331k€, *Ventricular Scar-Mediated Arrhythmogenesis (V-SMART)*, Principal Investigator.
4. EuroHPC 2021–5, 5M€, *Numerical modeling of cardiac electrophysiology at the cellular scale (MICROCARD)*, Co-Investigator.
5. Aquitaine Region, 2018–21, 76k€, *A novel therapy to safely and painlessly cardiovert atrial fibrillation with EPIC: External Painless Cardioversion (EPIC)*, Principal Investigator.
6. Federation of French Cardiologists, 2018–20, 80k€, *Amélioration de l'imagerie cardiaque non-invasive par caractérisation de la cicatrice (Improving noninvasive cardiac imaging by characterizing scar)*, Principal Investigator
7. Marie Curie International Training Network, 240k€, 2017–21 *Personalized Insilico Cardiology*, Local Coordinator
8. Fondation Recherche Médicale, Post-doc, 2017–9, 100k€, *Clinically and Experimentally Informed Personalized Computer Modeling to Improve Cardiac Ablation Therapy for Atrial Fibrillation*, Principal Investigator.
9. Conseil Régional d'Aquitaine, 2017–9, 184600 €, *Purkinje Characterization*, co-investigator.
10. PRACE Partnership for Advanced Computing in Europe, 2016–8, 5M compute hours, *CAMEL-Cardiac MechanoElectrics*, Principal Investigator
11. Medtronic research Contract, 2016–8, €150k, *Modelling tools for ventricular arrhythmias*, co-Principal Investigator.
12. Leducq Transatlantic Network of Excellence, 2016–20, €2M, *Repolarization Heterogeneity imaging for personalized therapy of heart arrhythmia*, co-investigator.
13. European Research Agency, ERACoSysMed, 2016–2108, €750K, *Personalized Multiphysics Simulations to Hone Cardiac Resynchronization Therapy*, Coordinator.
14. PRACE Partnership for Advanced Computing in Europe, 2014–6, 5M compute hours, *CAMEL-Cardiac MechanoElectrics*, Principal Investigator
15. Agence National de Recherche, 10/2014–10/2017, €50000/year, *High resolution numerical models for cardiac electrophysiology*, Coudière, Vigmond, Co-investigator:
16. Canadian Institutes of Health Research, 7/2010–6/2013; \$120,000/yr; *Clarifying the Nature of Cell-Cell Communication in Small Resistance Arteries*, Welsh, Vigmond; Co-investigator;
17. National Institutes of Health, 5/2010–4/2014; \$49,000/yr. *Multi-scale Modeling of Calcium Mediated Triggered Activity in the Heart*; Shiferaw, Plank, Vigmond; Co-investigator;.
18. Canadian Heart & Stroke Foundation Operating Grant, 6/2010–5/2013, \$58,000/yr, *Clarifying the Nature of Cell-Cell Communication in Small Resistance Arteries*.
19. St. Jude Medical, 5/2008-4/2009, \$52,000, *Phase angle as a Predictor of Ablation Electrode Surface Area in Contact with Tissue*.
20. MITACS Project Grant, 07/2008–06/2010; \$135,000/year; *Control of Cardiac Arrhythmias*, Glass, Nattel, Vinet, Leon, Vigmond; PI;

21. MITACS Networking Grant, 5/2008, \$10,000, *CARP Modelling Workshop*
22. iCORE ISPR Grant, 4/2008, \$3000, *CARP Modelling Workshop*
23. NSERC Operating Grant; 4/07–3/12, \$38,680/yr; *Development of an Electro-mechano-fluidic Biological Model*; Vigmond; PI;
24. Mathematics of Information Technology and Complex Systems Project Grant, 07/2005–06/2010; \$135,000/year; *Control of Cardiac Arrhythmias*, Glass, Nattel, Vinet, Leon, Vigmond; Co-Investigator;
25. Alberta Heart and Stroke Operating Grant, 6/2006–5/2009; \$45,000/yr, *Localization of Neural Modulation of Atrial Excitation and Repolarization, and the Arrhythmogenic Consequences*, Vigmond, Vinet; PI;
26. NSERC Operating Grant; 4/02–3/07, \$39,000/yr; *Modelling Cardiac Electrical Activity in 3D Using a Hybrid FEM/BEM Method*; Vigmond; PI
27. Mathematics of Information Technology and Complex Systems Project Grant, 07/2005–06/2007; \$135,000/year; *Control of Cardiac Arrhythmias*, Glass, Nattel, Kapral, Vinet, Leon, Vigmond; Co-investigator
28. Alberta Heart and Stroke Operating Grant, 6/2004–9/2007; \$65,000/year; *Computational and experimental investigation of the effects of spatial heterogeneity of refractoriness on inducibility and maintenance of atrial fibrillation in the mouse atria*, Nygren, Vigmond; Co-investigator
29. Alberta Heart and Stroke Operating Grant, 10/2004–9/2006; \$15,000/year; *Cell-to-cell communication in the resistance vascular*; Welsh, Vigmond; Co-investigator
30. Alberta Ingenuity Fund New Faculty Grant, 4/04–03/06; \$55,000/yr; *An Electromechanical Computer Heart Model Based on Discretization at the Single Cell Level*; Vigmond; PI
31. MITACS Project Grant, 6/03–5/05; \$15,000/yr; *Control of Atrial Fibrillation*; Glass, Nattel, Kapral, Vinet, Leon, Vigmond; Co-investigator
32. NSERC Collaborative Health Research Project Operating Grant; 4/02–3/05; \$20,000/yr; *An Intelligent Approach to Automatic Choice of Defibrillation Shock Strength*; Leon, Kimber, Vigmond; Co-investigator
33. Medtronic Project Grant; 2003–2004; (\$80,000 for multi-site study, no money but clinical data provided); *An Intelligent Approach to Automatic Choice of Defibrillation Shock Strength*; Leon, Kimber, Vigmond; Co-investigator
34. Alberta Heart and Stroke Operating Grant; 4/2002–3/2003; \$20,000/yr; *Computer Modelling of Atrial Arrhythmias*; Leon, Vigmond; Co-investigator
35. University of Calgary Travel Grant; 4/2002; \$1350; Vigmond; PI
36. University of Calgary Starter Grant; 6/2002–5/2004; \$10,000; Vigmond; PI
37. Capital Startup Grant; 6/2001–5/2002; \$25,000; *Electrophysiological Modeling*; Vigmond; PI

## B. Publications

*Peer-reviewed Journal papers*

- 1 K Gillette, B Winkler, S Kurath-Koller, D Scherr, **EJ Vigmond**, M Bär, and G Plank, “A computational study on the influence of antegrade accessory pathway location on the 12-lead electrocardiogram in Wolff-Parkinson-White syndrome.” *Europace*, 2024.
- 2 K Benali, **EJ Vigmond**, and M Haissaguerre, “Identifying purkinje involvement in ventricular fibrillation substrate.” *JACC. Clinical Electrophysiology*, vol. 10, p. 1791, 2024.
- 3 M Haïssaguerre, JM Sellal, K Benali, Bde Becker, P Defaye, P Pascale, R Martins, P Mabo, O Xhaet, F Extramiana, E Surget, T Lavergne, E Marijon, P Adragao, MS Carvalho, PU Milliez, M Laredo, E Gandjbakhch, C Giustetto, F Gaita, R Tiltz, L Jesel-Morel, J Steinfurt, T Arentz, S Knecht, M Duytschaever, L Roten, T Reichlin, M Fatemi, J Mansourati, C Kouakam, F Bessière, P Chevalier, R Tadros, L Macle, F Gallego, A Hadjis, F Sacher, D Pereira, J Hourdain, JC Deharo, R Eschalier, G Massoulié, P Maury, DG Latcu, F Anselme, J Duchateau, R Tixier, K Nademane, A Nogami, Nde Groot, **E Vigmond**, O Bernus, M Strik, P Bordachar, A Cathala, X Bouteiller, R Dubois, and S Ploux, “Distinct substrates of idiopathic ventricular fibrillation revealed by arrhythmia characteristics on implantable cardioverter-defibrillator.” *JACC. Clinical Electrophysiology*, 2024.
- 4 JB Tonko, M Ehresh, **E Vigmond**, A Chow, C Roney, and PD Lambiase, “Omnipolar conduction velocity mapping for ventricular substrate characterization: Impact of CV estimation method and EGM type on in vivo conduction velocity,” *Heart Rhythm*, 2024.
- 5 MAF Gsell, A Neic, MJ Bishop, K Gillette, AJ Prassl, CM Augustin, **EJ Vigmond**, and G Plank, “Forcepss-a framework for cardiac electrophysiology simulations standardization.” *Computer Methods and Programs in Biomedicine*, vol. 251, p. 108189, 2024.
- 6 JD Bayer, V Sobota, LR Bear, M Haissaguerre, and **EJ Vigmond**, “A his bundle pacing protocol for suppressing ventricular arrhythmia maintenance and improving defibrillation efficacy.” *Computer Methods and Programs in Biomedicine*, vol. 253, p. 108239, 2024.
- 7 AC Ernault, RFM Al-Shama, J Li, HD Devalla, JRde Groot, R Coronel, **E Vigmond**, and BJ Boukens, “Interpretation of field and leap potentials recorded from cardiomyocyte monolayers.” *American Journal of Physiology. Heart and Circulatory Physiology*, vol. 326, p. H800, 2024.
- 8 K Nanthakumar and **EJ Vigmond**, “Activation signatures for identifying critical isthmi of ventricular tachyarrhythmias.” *Journal of Cardiovascular Electrophysiology*, 2024.
- 9 S Qian, D Ugurlu, E Fairweather, M Strocchi, LD Toso, Y Deng, G Plank, **E Vigmond**, R Razavi, A Young, P Lamata, M Bishop, and S Niederer, “Developing cardiac digital twins at scale: Insights from personalised myocardial conduction velocity.” *MedRxiv : the Preprint Server for Health Sciences*, 2024.
- 10 P Cabanis, J Magat, J Rodriguez-Padilla, G Ramlugun, M Yon, Y Bihan-Poudec, N Pallares-Lupon, F Vaillant, P Pasdois, P Jais, P Dos-Santos, M Constantin, D Benoist, L Pourtau, V Dubes, J Rogier, L Labrousse, M Haissaguerre, O Bernus, B Quesson, R Walton, J Duchateau, **E Vigmond**, and V Ozenne, “Cardiac structure discontinuities revealed by ex-vivo microstructural characterization. a focus on the basal inferoseptal left ventricle region.” *Journal of Cardiovascular Magnetic Resonance : Official Journal of the Society for Cardiovascular Magnetic Resonance*, vol. 25, p. 78, 2023.
- 11 CH Roney, JA Solis Lemus, C Lopez Barrera, A Zolotarev, O Ulgen, E Kerfoot, L Bevis, S Misghina, C Vidal Horrach, OA Jaffery, M Ehresh, C Rodero, D Dharmaprani, GR Rios-Muñoz,



- A Ganesan, WW Good, A Neic, G Plank, LHGA Hopman, MJW Götte, S Honarbakhsh, SM Narayan, **E Vigmond**, and S Niederer, “[Constructing bilayer and volumetric atrial models at scale.](#)” *Interface Focus*, vol. 13, p. 20230038, 2023.
- 12 M Strocchi, S Longobardi, CM Augustin, MAF Gsell, A Petras, CA Rinaldi, **EJ Vigmond**, G Plank, CJ Oates, RD Wilkinson, and SA Niederer, “[Cell to whole organ global sensitivity analysis on a four-chamber heart electromechanics model using gaussian processes emulators.](#)” *PLoS Computational Biology*, vol. 19, p. e1011257, 2023.
- 13 A Petras, MAF Gsell, CM Augustin, J Rodriguez-Padilla, A Jung, M Strocchi, FW Prinzen, SA Niederer, G Plank, and **EJ Vigmond**, “[Mechanoelectric effects in healthy cardiac function and under left bundle branch block pathology.](#)” *Computers in Biology and Medicine*, vol. 156, p. 106696, 2023.
- 14 V Waldmann, F Iserin, **E Vigmond**, E Marijon, D Bonnet, T Lavergne, and M Haissaguerre, “[Two-to-one Purkinje-to-myocardium activation during ventricular fibrillation associated with hypertrophic cardiomyopathy.](#)” *HeartRhythm Case Reports*, vol. 9, p. 113, 2023.
- 15 M Strocchi, K Gillette, A Neic, MK Elliott, N Wijesuriya, V Mehta, **EJ Vigmond**, G Plank, CA Rinaldi, and SA Niederer, “[Effect of scar and His-Purkinje and myocardium conduction on response to conduction system pacing.](#)” *Journal of Cardiovascular Electrophysiology*, 2023.
- 16 Y Feng, R Dubois, M Hocini, and **EJ Vigmond**, “[Atrial periodic source spectrum from pre-operative body surface potentials predicts long-term recurrence of atrial fibrillation.](#)” *IEEE Transactions on Bio-Medical Engineering*, vol. PP, 2023.
- 17 JR Padilla, RD Anderson, C Joens, S Masse, A Bhaskaran, A Niri, P Lai, MA Azam, G Lee, **E Vigmond**, and K Nanthakumar, “[Orientation of conduction velocity vectors on cardiac mapping surfaces.](#)” *Europace*, 2023.
- 18 M Hurley, R Walton, **EJ Vigmond**, M Haissaguerre, O Bernus, and E White, “[Attenuation of stretch-induced arrhythmias following chemical ablation of purkinje fibres, in isolated rabbit hearts.](#)” *Frontiers in Physiology*, vol. 14, p. 1154157, 2023.
- 19 GS Ramlugun, K Kulkarni, N Pallares-Lupon, BJ Boukens, IR Efimov, **EJ Vigmond**, O Bernus, and RD Walton, “[A comprehensive framework for evaluation of high pacing frequency and arrhythmic optical mapping signals.](#)” *Frontiers in Physiology*, vol. 14, p. 734356, 2023.
- 20 W Escande, JB Gourraud, M Haissaguerre, E Gandjbakhch, T Lavergne, R Martins, G Cheniti, P Krisai, JS Hermida, P Maury, JL Merino, JL Pasquié, N Combes, E Surget, J Duchateau, T Pambrun, N Derval, M Hocini, P Jaïs, PG Postema, K Nademane, **E Vigmond**, O Bernus, F Sacher, and V Probst, “[Malignant Purkinje ectopy induced by sodium channel blockers.](#)” *Heart Rhythm*, 2022.
- 21 M Haissaguerre, G Cheniti, K Nademane, F Sacher, J Duchateau, R Coronel, **E Vigmond**, BJ Boukens, and O Bernus, “[Dependence of epicardial T-wave on local activation voltage in Brugada syndrome.](#)” *Heart Rhythm*, vol. 19, p. 1686, 2022.
- 22 J Rodriguez-Padilla, A Petras, J Magat, J Bayer, Y Bihan-Poudec, D El Hamrani, G Ramlugun, A Neic, CM Augustin, F Vaillant, M Constantin, D Benoist, L Pourtau, V Dubes, J Rogier, L Labrousse, O Bernus, B Quesson, M Haissaguerre, M Gsell, G Plank, V Ozenne, and **E Vigmond**, “[Impact of intraventricular septal fiber orientation on cardiac electromechanical](#)

- function.” *American Journal of Physiology. Heart and Circulatory Physiology*, vol. 322, p. H936, 2022.
- 23 C Rodero, M Strocchi, M Marciniak, S Longobardi, J Whitaker, MD O’Neill, K Gillette, C Augustin, G Plank, **EJ Vigmond**, P Lamata, and SA Niederer, “[Correction: Linking statistical shape models and simulated function in the healthy adult human heart.](#)” *PLoS Computational Biology*, vol. 18, p. e1010196, 2022.
- 24 RD Anderson, J Rodriguez Padilla, C Joens, S Masse, A Bhaskaran, K Magtibay, A Niri, J Asta, P Lai, MA Azam, **E Vigmond**, and K Nanthakumar, “[On the electrophysiology and mapping of intramural arrhythmic focus.](#)” *Circulation. Arrhythmia and Electrophysiology*, vol. 15, p. e010384, 2022.
- 25 M Haïssaguerre, K Nademanee, F Sacher, G Cheniti, M Hocini, E Surget, R Dubois, **E Vigmond**, and O Bernus, “[Multisite conduction block in the epicardial substrate of brugada syndrome.](#)” *Heart Rhythm*, vol. 19, p. 417, 2022.
- 26 Y Feng, CH Roney, JD Bayer, SA Niederer, M Hocini, and **EJ Vigmond**, “[Detection of focal source and arrhythmogenic substrate from body surface potentials to guide atrial fibrillation ablation.](#)” *PLoS Computational Biology*, vol. 18, p. e1009893, 2022.
- 27 M Haïssaguerre, G Cheniti, M Hocini, F Sacher, FD Ramirez, H Cochet, L Bear, R Tixier, J Duchateau, R Walton, E Surget, T Kamakura, H Marchand, N Derval, P Bordachar, S Ploux, T Takagi, T Pambrun, P Jais, L Labrousse, M Strik, H Ashikaga, H Calkins, **E Vigmond**, K Nademanee, O Bernus, and R Dubois, “[Purkinje network and myocardial substrate at the onset of human ventricular fibrillation: implications for catheter ablation.](#)” *European Heart Journal*, vol. 43, p. 1234, 2022.
- 28 CH Roney, I Sim, J Yu, M Beach, A Mehta, J Alonso Solis-Lemus, I Kotadia, J Whitaker, C Corrado, O Razeghi, **E Vigmond**, SM Narayan, M O’Neill, SE Williams, and SA Niederer, “[Predicting atrial fibrillation recurrence by combining population data and virtual cohorts of patient-specific left atrial models.](#)” *Circulation. Arrhythmia and Electrophysiology*, vol. 15, p. e010253, 2022.
- 29 JD Bayer, V Sobota, A Moreno, P Jaïs, and **EJ Vigmond**, “[The purkinje network plays a major role in low-energy ventricular defibrillation.](#)” *Computers in Biology and Medicine*, vol. 141, p. 105133, 2022.
- 30 C Mendonca Costa, P Gemmell, MK Elliott, J Whitaker, FO Campos, M Strocchi, A Neic, K Gillette, **E Vigmond**, G Plank, R Razavi, M O’Neill, CA Rinaldi, and MJ Bishop, “[Determining anatomical and electrophysiological detail requirements for computational ventricular models of porcine myocardial infarction.](#)” *Computers in Biology and Medicine*, vol. 141, p. 105061, 2022.
- 31 M Strocchi, N Wijesuriya, MK Elliott, K Gillette, A Neic, V Mehta, **EJ Vigmond**, G Plank, CA Rinaldi, and SA Niederer, “[Leadless biventricular left bundle and endocardial lateral wall pacing versus left bundle only pacing in left bundle branch block patients.](#)” *Frontiers in Physiology*, vol. 13, p. 1049214, 2022.
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#### *Book Chapters*

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#### *Invited Talks*

- "Translating conduction velocity measurements from 2D to 3D," Signals Summit, Chicago, Dec. 2, 2022.
- "Computational modelling for translational research," 2<sup>nd</sup> CRCTB Scientific Day, Bordeaux, Sept 19, 2022.
- "Modelling Arrhythmia in the His / Purkinje System," Amsterdam Medical Center, Amsterdam, March, 2022.
- "Using Machine Learning on Body Surface Potential Maps to Improve Ablation," Colibri Focus Workshop, Graz, Austria, Feb, 2022.
- "openCARP as an *in silico* Research Tool," Atrial Signals Symposium 2021, Karlsruhe, Germany, Sept, 2021.
- "Modelling Arrhythmia and the Purkinje System," MCF2020 – Modelling the Cardiac Function, Milano, Italy (on-line), Aug 31, 2020.
- "Modelling Arrhythmia in the His / Purkinje System," Simula Research Laboratory, Oslo, Norway, March 5, 2020.
- "Pacing and Reentry in the Purkinje System," 10<sup>th</sup> TRM Forum, Lugano, Switzerland, Dec 8, 2019.

- “Modelling Atrial Fibrosis,” 18<sup>th</sup> Atrial Fibrillation Symposium, Copenhagen, Denmark, Feb 8, 2019.
- “Biophysical Models of the Fibrillating Atria: Fibrosis and Electrophysiological Considerations”, *The Heart by Numbers*, Biophysical Society Thematic Meeting, Berlin, September 2018.
- “Treatment of Cardiac Electrophysiological Problems”, CARS 2018, Berlin, June 2018.
- “Computer model-assisted AF therapy guidance”, EHRA 2018, Barcelona, March, 2018.
- “Quantification of Cardiac Conduction and Repolarization Reserves,” TRW Forum, Lugano, Switzerland, Dec 5, 2017.
- “PUSHCART - Personalized Multiphysics Simulations to Hone Cardiac Resynchronization Therapy,” Systems Medicine Workshop, Ljubljana, Slovenia, June 8, 2017
- “Atrial fibrillation: A wine and silicone informed view,” Montreal Heart Institute, Montreal, Canada, June 17, 2016.
- “Clinical Application,” Medtronic, Minneapolis, Minnesota, USA, May 16, 2016.
- “Is lesion modelling a reliable substitute for lesion visualization?”, 15<sup>th</sup> Atrial Fibrillation Symposium, Rome, Italy, Feb 18, 2016.
- “Le coeur virtuel : quand l’électrogramme ne suffit plus,” Soirée de santé, Université de Bordeaux, Bordeaux, France Dec. 10, 2015.
- “Percolation as a Mechanism for Atrial Arrhythmogenesis,” TRW Forum, Lugano, Switzerland, Dec 7, 2015.
- “Atrial Fibrillation: Scars and Ablation,” Peter Munk Cardiac Center, Toronto General Hospital, Rounds, October 23, 2015.
- “Cardiac Applications of Computational Electrophysiology,” BCAM Workshop on Quantitative Biomedicine for Health and Disease, Bilbao, Spain, February 17–18, 2015.
- “Phase mapping from the heart to the torso,” Simula, Oslo, Norway, Nov 6, 2014.
- “Arrhythmia Thy Name Be Purkinje,” State of Electrophysiology Meeting, Halifax, Canada, June 28, 2014.
- “Wide Area Defibrillation, and Safety Factor of Cardiac Propagation ,” Department of Medical Biophysics, Medical University of Graz, Graz, Austria, June 4, 2014.
- “Effects of the Purkinje System on Cardiac Electrical Activity,” ICENet 2014, Moscow, Russia, May 29, 2014.
- “Recreating Atrial Rotors In Silico,” TRW Forum, Lugano, Switzerland, Dec 3, 2013.
- “The Role of the Purkinje System in Reentry: Insights from modelling,” *Heart Rhythm Society Conference*, May 9, 2013.

- “Modelling Arrhythmogenic Consequences of the Purkinje System,” *The 1st HD Physiology International Symposium: Integrative Multi-level Systems Biology for In Silico Cardiology and Pharmacokinetics*, Tokyo, Japan, January 20–21, 2012.
- “Electromechanical Modelling of the Left Atrium,” Symposium de GRSTB, École Polytechnique, Montreal, Canada, Oct 14, 2011.
- “High Performance Electrophysiological Computer Modelling with CARP,” Bordeaux University, Bordeaux France, May 20, 2011.
- “Modelling Effects of the Purkinje System,” Division of Imaging Sciences, King’s College, London UK, May 24, 2011.
- “High Performance Electrophysiological Computer Modelling using CARP,” Centre for Arrhythmia Research, University of Michigan, Jan 7, 2011.
- “Investigating the Arrhythmogenic Role of the Purkinje System through Computer Simulation,” CAMBAM, McGill University, Feb 11, 2010.
- “Investigating the Arrhythmogenic Role of the Purkinje System through Computer Simulation,” Faculty of Biomedical Engineering, Dalhousie University, Jan 28, 2010.
- “Investigating the Purkinje System through Computer Simulation,” Libin Cardiovascular Institute, University of Calgary, Jan 13, 2010.
- “Large-scale Modelling of the Heart,” Virginia Commonwealth University, Richmond, VA, Oct 16, 2009.
- “Large-scale and detailed electrophysiological modelling,” Mathematical Modeling and Computing in Electrocardiology, University of Nantes, France, June 2009
- “The Virtual heart: Recent Advances and Applications of Modelling,” EP Rounds, Foothills General Hospital, Nov. 26, 2008.
- “Computer Modeling of the Purkinje System,” McGill University, Montreal, QC, June 4, 2008.
- “Reentry Induction and Maintenance in the Heterogeneous Atria,” GEPROM Conference, Montreal, QC, June 20, 2008
- “Understanding Cardiac Function Through Computer Modelling,” Medtronic CRMD, Minneapolis, MN, Dec 7, 2007.
- “Heart Function and CARP,” University of California at San Francisco Medical Center, San Francisco, CA, Oct 30, 2007
- “The Growth of CARP,” Oxford University, Oxford, UK, Sept 28, 2007.
- “Understanding Cardiac Function Through Computer Modelling,” McGill University, Montreal, QC, June, 2007.
- “Understanding Cardiac Function Through Computer Modelling,” Université de Montréal, Montreal, QC, June, 2007.
- “Modelling the Whole Heart,” Oxford University, Oxford, UK, Sept 28, 2006.

- “Modelling of Blood Flow and Electromechanical Coupling in the Human Heart,” University of Montreal, Montreal, Quebec, November 20, 2006.
- “Mathematical Techniques for Simulating Activity of Cardiac Tissue,” Integrated Biology Workshop, Oxford University, Oxford, UK, September 29, 2006.
- “Modelling the Whole Heart,” Integrated Biology Workshop, Oxford University, Oxford, UK, September 28, 2005.
- “Large-Scale Biological Simulation,” Tulane University, New Orleans, Louisiana, April 20, 2004.

### C. Technology Transfer

#### *Start-ups*

- [Numericor, GmbH](#) : cofounder
- [CardioSolv, LLC](#): cofounder
- [CardioSolv Ablation Technologies](#): scientific advisory board

### V. SERVICE ACTIVITIES

**Associate Editor:** *IEEE Transactions on Biomedical Engineering*, 2007–2013

**Section Editor:** *Frontiers in Physiology: Cardiac Electrophysiology Section*, 2024–present

#### *Advisory Boards*

1. Chairman, International Scientific Advisory Board, [BioTechMed Graz](#), Graz University, Graz, Austria, 2012-present.

#### *Journal Reviews (selected)*

1. American Journal of Physiology - Heart and Circulatory Physiology
2. Canadian Journal of Cardiology
3. Chaos
4. Circulation: Arrhythmia and Electrophysiology
5. Circulation Research
6. Computational Methods in Biomechanics and Biomedical Engineering
7. Europace
8. Heart Rhythm
9. IEEE Transactions on Biomedical Engineering.
10. International Journal Artificial Intelligence in Medicine

11. International Journal of High Performance Computing Applications
12. International Journal of Numerical Methods in Biomedical Engineering
13. JACC EP
14. Journal of Computational Physics
15. Journal Of Molecular and Cellular Cardiology
16. Mathematical Biosciences
17. Medical and Biological Engineering and Computing:
18. Proceedings of the Royal Academy
19. Progress in Biophysics and Molecular Biology
20. SIAM Journal on Scientific Computing
21. Transactions of the Royal Society

*Grant Reviews*

1. Fondazioni Cariplo - Life Sciences Panel; reviewer; 2023.
2. Norwegian Research Council - Life Sciences Panel; panel member; 2014–5, 2017, 2022–3.
3. TV3 Marathon Spain - Cardiovascular section; Review Coordinator; 2015, 2023.
4. Danish Cardiovascular Academy - PhD and Post-doc grants; panel member; 2023–4.
5. BioTechMed-Graz - Young Researcher and Flagship programs - panel chair; 2022.
6. JTL German Research Initiative - Computational Life Sciences; panel member; 2022.
7. ERC Starter Grant; 2022.
8. JTL German Research Initiative - Computational Life Sciences; panel member; 2022.
9. JTL Demonstrators for Individualised Medicine call; panel member; 2018.
10. King's College London Health Partner's Fund; reviewer; 2016–7
11. ERACoSysMed JTC-2 Call; panel member; 2017.
12. Swiss Science Fund; reviewer; 2018, 2016
13. Ontario Research Excellence Fund; panel member; 2011
14. Swiss National Supercomputing; reviewer; 2011, 2021
15. Ohio SuperComputing Centre; 2011
16. Wellcome Trust external reviewer: 2009,2015,2017,2018
17. HSFC external reviewer; 2008-10

18. AIF Scholarship Committee; 2006
19. CFI Grid Computing Infrastructure User Panel; 2006
20. Canadian Institutes of Health Research primary internal grant reviewe; 2004
21. Canadian Institutes of Health Research primary external grant reviewer; 2003
22. NSERC external reviewer; 2004, 2009
23. Swiss Research Council; 2015

### *Conference Organization*

- Co-Chair - Gordon Research Conference: Cardiac Arrhythmia Mechanisms, Il Ciocco, Italy, 2025
- Co-organizer - RICAM Workshop on Cardiovascular Modeling, Linz, Austria, Nov, 2023.
- Co-Vice-Chair - Gordon Research Conference: Cardiac Arrhythmia Mechanisms, Galveston, Tx, 2023
- Session Chair - Computing in Cardiology Conference, Rimini, Italy, September, 2020.
- Abstract Judge - Computing in Cardiology Conference, 2015–present.
- Co-organizer - Functional Imaging and Modeling of the Heart, Bordeaux, France, June 6–8, 2019.
- Session Judge - EHRA Conference, Lisbon, Portugal, March 19, 2019.
- Organizer - 2<sup>nd</sup> CARPentry Workshop, Bordeaux, France, Sept 17-19, 2018.
- Co-organizer - Workshop on Mathematical Methods in Cardiac Electrophysiology, Ottawa, Canada, Nov 4–6, 2017.
- Co-organizer - CARPentry Workshop, Graz, Austria, July 12-4, 2017.
- Session Chair - Heart Rhythm Society Conference, Chicago, USA, May 2017.
- Session Chair - CardioStim, Nice, France, June 2016.
- Symposium organizer - COSINE6, Bordeaux, France, May 2016.
- Associate Editor - IEEE EMBS Conference, 2011–5.
- Track Chair - IEEE EMBS Conference in Boston, MA, Aug, 2011.
- Co-Chair - 11th Noninvasive Functional Source Imaging and International Bioelectromagnetism Society, Banff AB, May 2011.
- Session Chair - Heart Rhythm Society Conference, Denver, CO, May, 2010.
- Session Chair - Alberta Biomedical Engineering Conference, Banff, Alberta, Oct., 2009,
- Session Chair - Canadian Medical and Biological Engineering Conference, Calgary, May, 2009.



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- Organizer - CARP Workshop, Banff, September, 2008.
  - Session Chair - IEEE EMBS Conference in Vancouver, BC, Aug, 2008.
  - Session Chair - 5th International Conference on Bioelectromagnetism and 5th International Symposium on Noninvasive Functional Source Imaging within the Human Brain, Minneapolis, Minnesota, May, 2005
  - Session Chair - Alberta Biomedical Engineering Conference, Banff, Alberta, Oct., 2005
  - Session Chair - Alberta Biomedical Engineering Conference, Banff, Alberta, Oct., 2004
  - Session Chair - Alberta Biomedical Engineering Conference, Banff, Alberta, Oct., 2003
  - Session Chair - IEEE EMBS Conference in Houston, TX Oct, 2002.