

CURRICULUM VITAE

I. BIOGRAPHICAL DATA

Edward Joseph Vigmond
Citizenship: Canadian

IHU Liryc
Hôpital Xavier Arnozan
Avenue de Haut-Levêque
33600 Pessac France
edward.vigmond@u-bordeaux.fr
<https://www.math.u-bordeaux.fr/~evigmond/>



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

- Enrico Rizzardi, Trento University, 3/2023–5/2023
- 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 Madhaven, 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, 4th year thesis, B.Sc., *Reentry in a Geometrically Accurate Model of the Atria*

C. Postdoctoral Fellow Trainees

1. Dr. Patricia Martinez, *Atrial Digital Twins*, 02/2025-01/2027
2. Dr. Karl Magtibay, *Neural Influence on Arrhythmia*, 11/2024-10/2027
3. Dr. Sara Zein, *Engineer*, 03/2024-02/2027
4. Dr. Jafar Moradicheghamah, *Stretch-induced ischemic arrhythmias*, 03/2024-02/2027
5. Dr. Fakhrieldine Bader, *High Resolution Atrial Models*, 02/2024-09/2024
6. Dr. Masimba Namaire, *Torso recordings of micro-anatomical reentries*, 05/2023–04/26
7. Dr. Alireza Kazemi, *High Resolution Modelling of AF Substrates*, 10/2022–12/22
8. Dr. Argyrios Petras, *Electromechanical arrhythmia*, 09/2019–08/2021
9. Dr. Jairo Padilla, *Electrogram Computation*, 6/2018–05/2020
10. Dr. Julien Bouyssier, *Cardiac Resynchronization Therapy*, 1/2018-12/2019
11. Dr. Peter Langfield, *Repolarization Abnormalities*, 10/2017-8/2021
12. Dr. Mirabeau Saha, *Atrial Arrhythmias*, 02/2017–01/2019
13. Dr. Namit Gaur, *Ionic modelling*, 09/2016–12/2019
14. Dr. Jaun Gomez, *Electrical Cardiac Resynchronization Therapy*, 05/2016–09/2017
15. Dr. Caroline Roney, *Atrial Electrophysiological Modelling*, 05/2015–08/2017
16. Dr. Ali Pashei, *Cardiac Electrophysiological Modelling*, 04/2014–06/2016
17. Dr. Jason Bayer, *Cardiac Electrophysiological Modelling*, 03/2013–08/2016
18. Dr. Martin Bishop, *Effect of Blood Vessels on Defibrillation Shocks*, May–July, 2009
19. Dr. Rafael Sebastian, *Parameter Sensitivity in Solving the Bidomain Equations*, March, 2007
20. Dr. Clyde Clements, *Modeling of Cardiac Mechano-Electrical Activity*, 1/01/04–01/03/06
21. Dr. Gernot Plank, *Modeling of Cardiac Electrical Activity*, 9/02-4/03

IV. SCHOLARLY ACTIVITIES

A. Research Support

1. EuroHPC 2024–7, 5M€, *Numerical modeling of cardiac electrophysiology at the cellular scale (MICROCARD2)*, Co-Investigator.

B. Publications

Peer-reviewed Journal papers

- 1 **EJ Vigmond**, S Massé, CH Roney, JD Bayer, and K Nanthakumar, “[The accuracy of cardiac surface conduction velocity measurements.](#)” *JACC. Clinical Electrophysiology*, 2024.
- 2 C Monaco, G Cheniti, K Benali, J Duchateau, K Vlachos, F Sacher, S Ploux, **E Vigmond**, O Bernus, and M Haïssaguerre, “[Electrophysiological characteristics associated with spontaneous termination of ventricular fibrillation.](#)” *JACC. Clinical Electrophysiology*, vol. 10, p. 2512, 2024.
- 3 NMS de Groot, A Kleber, SM Narayan, EJ Ciaccio, O Doessel, O Bernus, O Berenfeld, D Callans, V Fedorov, J Hummel, M Haissaguerre, A Natale, N Trayanova, P Spector, **E Vigmond**, and E Anter, “[Atrial fibrillation nomenclature, definitions, and mechanisms: Position paper from the international working group of the signal summit.](#)” *Heart Rhythm*, 2024.
- 4 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.
- 5 K Benali, **EJ Vigmond**, and M Haissaguerre, “[Identifying Purkinje involvement in ventricular fibrillation substrate.](#)” *JACC. Clinical Electrophysiology*, vol. 10, p. 1791, 2024.
- 6 M Haïssaguerre, JM Sellal, K Benali, B de 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 Tilz, 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 Nademanee, A Nogami, N de 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.
- 7 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.
- 8 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.
- 9 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.
- 10 AC Ernault, RFM Al-Shama, J Li, HD Devalla, JR de 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.

- 11 K Nanthakumar and **EJ Vigmond**, “[Activation signatures for identifying critical isthmi of ventricular tachyarrhythmias.](#)” *Journal of Cardiovascular Electrophysiology*, 2024.
- 12 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.

Peer-reviewed conference papers (from 2024)

- 1 N Denham, AM Suszko, M Nemaire, A Bhaskaran, H Gonna, S Masse, K Nanthakumar, E Downar, EJ Vigmond⁸, V Chauhan, “Intracardiac microvolt activation alternans reflects local conduction heterogeneity and identifies the entrance sites of ventricular tachycardia in ischemic cardiomyopathy,” *Heart Rhythm 2024*, Boston, USA, May, 2024.
- 2 A Zolotarev, C Rodero, S Narayan, E Vigmond, G Plank, S Niederer, C Roney, “Anatomical and Physiological Features Improve AF Ablation Outcome Prediction: A Combined Deep Learning and In-Silico Approach,” *Heart Rhythm 2024*, Boston, USA, May, 2024.
- 3 M Ehresh, H Valli, A Zolotarev, O Jaffery, C Lopez Barrera, Vigmond⁴, Halder, C Roney, “The determination of ablation targets in patient-specific atrial models is influenced by the data used for calibration,” *Heart Rhythm 2024*, Boston, USA, May, 2024.
- 4 S Misghina, J Solis-Lemus, C Lopez-Barrera, E Rauseo, E Vigmond, S Niederer, N Aung, P B. Munroe, S Petersen, C Roney¹, “Patient-Specific Biatrial Modelling Framework for Predicting Atrial Fibrillation Outcomes,” *Heart Rhythm 2024*, Boston, USA, May, 2024.
- 5 O Jaffery, C López Barrera, C Rodero, A Zolotarev, W Good, G Slabaugh, S Niederer, EJ Vigmond, Caroline H. Roney, “Towards Automated Generation of Ablation Lesion Masks: A Unison of Electro and Optic Flow Mapping,” *Heart Rhythm 2024*, Boston, USA, May, 2024.

Invited Talks

- “DAWN-AF Digital Twins to Treat Atrial Fibrillation,” EP PerMed Conference, Berlin, Germany, Feb, 2025.
- “Mapping of Purkinje and Intramural Sources, in Ventricular Arrhythmias,” Heart Rhythm Conference, Boston, USA, May, 2024.
- “Using modelling to improve interpretation of cardiac electrograms,” INdAM Workshop Mathematical and Numerical Modeling of the Cardiovascular System Roma, 16 April, 2024.

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. Danish Cardiovascular Academy - PhD and Post-doc grants; panel member; 2023–5.
2. Norwegian Research Council - Life Sciences Panel; panel member; 2014–25.
3. ERC Advanced Grant; 2025.
4. Fondazioni Cariplo - Life Sciences Panel; reviewer; 2023.
5. TV3 Marathon Spain - Cardiovascular section; Review Coordinator; 2015, 2023.
6. BioTechMed-Graz - Young Researcher and Flagship programs - panel chair; 2022.
7. JTL German Research Initiative - Computational Life Sciences; panel member; 2022.
8. ERC Starter Grant; 2022.
9. JTL German Research Initiative - Computational Life Sciences; panel member; 2022.
10. JTL Demonstrators for Individualised Medicine call; panel member; 2018.
11. King's College London Health Partner's Fund; reviewer; 2016–7
12. ERACoSysMed JTC-2 Call; panel member; 2017.
13. Swiss Science Fund; reviewer; 2018, 2016
14. Ontario Research Excellence Fund; panel member; 2011
15. Swiss National Supercomputing; reviewer; 2011, 2021
16. Ohio SuperComputing Centre; 2011
17. Wellcome Trust external reviewer: 2009,2015,2017,2018
18. HSFC external reviewer; 2008-10
19. AIF Scholarship Committee; 2006
20. CFI Grid Computing Infrastructure User Panel; 2006
21. Canadian Institutes of Health Research primary internal grant reviewee; 2004
22. Canadian Institutes of Health Research primary external grant reviewer; 2003
23. NSERC external reviewer; 2004, 2009
24. 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 - 2nd 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.
- 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.