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Professor Pierre Benoit <u>Boulanger</u>

Correspondence language: English

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The primary information is denoted by (*)

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Professor Pierre **Boulanger**

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes

Degrees

- 1994/4   Doctorate, Computer and Electrical Engineering, École Polytechnique de Montréal

Supervisors: Paul Cohen, 1988/9 - 1994/4

- 1982/3   Master's Thesis, Physics, Université Laval

Supervisors: Marcel Baril, 1980/9 - 1982/3

- 1980/4   Bachelor's, Engineering Physics, Université Laval

Recognitions

2015/9   Ward of 21 Century Best Idea Award
Ward of the 21 Century Organization
Honor
Best Idea in Medical Technology for the MedROAD project

2014/7 - 2023/6   CISCO Chair in Healthcare Solutions - 2,000,000
CISCO Systems
Prize / Award
The University of Alberta and Cisco established a Cisco Research Chair in Healthcare
Solutions, which focuses on how advanced technologies and strategies can support
health care.The chair involves research, development, and innovation in the use of
transformational technologies that can drive collaboration, productivity, and efficiency in
the health-care sector in Canada and around the world.

User Profile

Research Specialization Keywords: Medical Imaging, 3D Industrial Inspection, Surgical Simulation, Augmented
Reality, High Performance Computing, Non-Linear Optimization, Rapid Product Development, Virtualized Reality,
Virtual Manufacturing

Employment

2020/1	CTO Naiad Lab Inc. Develop and plan technologies for MedROAD and MedBIKE products commercialized by Naiad Lab Inc
2008/7	Scientific Director of the SERVIER Virtual Cardiac Centre SERVIER Virtual Cardiac Centre, University of Alberta Hospital
2005/7	Professor in Computer Science Computing Science, Science, University of Alberta Full-time, Professor Tenure Status: Tenure
2002/7	Director of the Advanced Man Machine Interface Laboratory Advanced Man-Machine Interface Laboratory, University of Alberta
2015/6 - 2020/1	CEO MedROAD Inc.
2011/4 - 2013/2	Principle Investigator for Multimedia Systems Edmonton Division, TRTech
2001/7 - 2005/6	Associate Professor Computing Science, Science, University of Alberta Full-time, Associate Professor Tenure Status: Tenure
2001/4 - 2003/3	CTO Digital Light and Sound
1984/4 - 2001/4	Senior Research Officer Information Technology, National Research Council Canada
1982/3 - 1984/4	Research Engineer Electron Microscopy Division, Bausch and Lomb

Research Funding History

Awarded [n=12]

2020/3 - 2023/2 Co-applicant	KIAS Research Cluster Grant, Grant **Funding Sources:** Kule Institute for Advanced Study (KIAS) Total Funding - 80,000 Portion of Funding Received - 30,000 Funding Competitive?: Yes
2018/4 - 2022/3 Principal Applicant	NSERC Discovery Grant, Grant **Funding Sources:** Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 140,000 Portion of Funding Received - 100 Funding Competitive?: Yes
2012/8 - 2021/12 Principal Investigator	CISCO Chair in Healthcare Solutions, Research Chair **Funding Sources:**

CISCO Systems Canada
University collaboration program
Total Funding - 2,000,000
Portion of Funding Received - 2,000,000
Funding Competitive?: Yes

2020/7 - 2020/12 Principal Applicant	Grant money for the deployment of MedROAD in Pincher Creek, Grant

Funding Sources:
Cisco Systems Canada Inc.
Total Funding - 50,000
Portion of Funding Received - 50,000
Funding Competitive?: No

2019/6 - 2020/5 Co-applicant	SSHRC Insight Development Grant (IDG), Grant

Funding Sources:
Social Sciences and Humanities Research Council of Canada (SSHRC)
IDG
Total Funding - 64,398
Portion of Funding Received - 20
Funding Competitive?: Yes

2019/4 - 2020/3 Principal Applicant	NSERC RTI, Grant

Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
RTI
Total Funding - 119,000
Portion of Funding Received - 100
Funding Competitive?: Yes

2017/4 - 2019/3 Principal Applicant	Eye-Tracker Augmented Trainer in Teaching Complex Laparoscopic Procedures, Grant

Funding Sources:
Royal Alexandra Hospital Foundation
CAMIS Grant
Total Funding - 25,000
Portion of Funding Received - 25,000
Funding Competitive?: Yes

2016/4 - 2019/3 Principal Applicant	Multiview Ultrasound Fusion for Cardiac and Non-cardiac Imaging, Grant

Funding Sources:
Canadian Institutes of Health Research (CIHR)
CHRP
Total Funding - 488,592
Portion of Funding Received - 488,592
Funding Competitive?: Yes

2015/4 - 2019/3 Co-applicant	Telemonitoring and protocolized case management for hypertension in seniors (TECHNOMED), Grant

Funding Sources:
Canadian Institutes of Health Research (CIHR)
eHIPP
Total Funding - 1,540,000
Portion of Funding Received - 154,000
Funding Competitive?: Yes

Principal Applicant : Raj Padwal

2013/4 - 2018/3 Principal Investigator	Skill Transfer and Evaluation of Minimally Invasive Surgery Procedures Using Visuo-haptic Communication, Grant

Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery Grant
Total Funding - 125,000
Portion of Funding Received - 125,000
Funding Competitive?: Yes

2014/4 - 2016/3 Principal Applicant	Depth of View in MIS Surgery: Problems and Solutions, Grant

Funding Sources:
Royal Alexandra Hospital Foundation
MIS Surgery
Total Funding - 47,000
Portion of Funding Received - 47,000
Funding Competitive?: Yes

2010/1 - 2016/1 Co-investigator	Contribution by SERVIER Canada to SERVIER Virtual Cardiac Center under University Collaboration Program, Grant

Funding Sources:
SERVIER Canada
University Collaboration Program
Total Funding - 1,000,000
Portion of Funding Received - 1,000,000
Funding Competitive?: No

Co-investigator : Michelle Noga

Completed [n=4]

2017/4 - 2018/3 Principal Applicant	Development of a Visuo-haptic Guidance System for Surgical Skills Transfer, Grant

Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
RTI
Total Funding - 115,152
Portion of Funding Received - 115,152
Funding Competitive?: Yes

2016/4 - 2017/3 Co-applicant	Integrated eTechnology: Seniors Care for the 21st Century, Grant

Funding Sources:
TVN
Catalyst Grant Program
Total Funding - 99,773
Portion of Funding Received - 10,000
Funding Competitive?: Yes

2015/4 - 2016/3 Principal Investigator	Magnetic Tracking Sensors for Open Surgery Evaluation, Ultrasound Multi-view Fusion, and Cardiac Modeling, Grant

Funding Sources:
NSERC
Research Tools and Instruments
Total Funding - 28,412
Portion of Funding Received - 28,412
Funding Competitive?: Yes

2011/4 - 2015/3 Co-investigator	Team in Safety Culture for Spinal Manipulation Therapy, Grant
	Funding Sources: Canadian Institutes of Health Research (CIHR) Team Grant Total Funding - 2,000,000 Portion of Funding Received - 308,500 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's non-Thesis [n=8]

2017/6 - 2018/5 Principal Supervisor	Comet Li (Completed) , University of Alberta Thesis/Project Title: Spin class for MedBike Present Position: Student
2017/5 - 2018/2 Principal Supervisor	Mohammed Shoaib Khan (Completed) , University of Alberta Thesis/Project Title: Collaborative VR Using Proxy-Haptics Present Position: Graduate Student
2017/5 - 2018/2 Principal Supervisor	Ismail Kiron (Completed) , University of Alberta Thesis/Project Title: Collaborative VR using proxy-Haptic Present Position: Graduate Student
2017/5 - 2018/2 Principal Supervisor	Amir Pournajib (Completed) , University of Alberta Thesis/Project Title: Monitoring Physical Rehabilitation Using Hexoskin Present Position: Graduate Student
2016/8 - 2017/3 Principal Supervisor	Vaibhav Dixit (Completed) , University of Alberta Thesis/Project Title: Collaborative Patient Monitoring System Present Position: Research Assistant
2016/8 - 2017/3 Principal Supervisor	Muhammad Zeshan (Completed) , University of Alberta Thesis/Project Title: Medical Data Analytics Interface for Remote Monitoring of Aged Care Patients Present Position: Research Assistant
2016/5 - 2017/8 Principal Supervisor	Hong Zu Li (Completed) , University of Alberta Thesis/Project Title: Detection of Faulty 12 ECG Measurements Using Machine Learning Present Position: PhD Student
2016/5 - 2017/8 Co-Supervisor	Ruyi Wang (Completed) , University of Alberta Thesis/Project Title: Attention Study in Children using Virtual Reality Present Position: Unknown

Master's Thesis [n=17]

2018/9 - 2020/4 Principal Supervisor	Mahdi Rahmani Hanzaki (In Progress) , University of Alberta Student Degree Expected Date: 2020/2 Thesis/Project Title: Augmented Reality Mannequin for Surgical Training Present Position: Grad Student
2018/5 - 2020/4 Co-Supervisor	Pouneh Gorji (In Progress) , University of Alberta Student Degree Expected Date: 2020/2 Thesis/Project Title: Ultrasound Image Segmentation using U-Net Present Position: Grad Student

2017/9 - 2019/2 Co-Supervisor	Melissa Woghiren (In Progress) , University of Alberta Student Degree Expected Date: 2020/4 Thesis/Project Title: Early Stoke Detection Using Eye Tracking Present Position: Grad Student
2017/5 - 2019/1 Principal Supervisor	Mina Abdi (In Progress) , University of Alberta Thesis/Project Title: Psychophysical Study of proxy-Haptics Present Position: Graduate Student
2017/4 - 2018/4 Co-Supervisor	Sadegh Charmchi (Completed) , University of Alberta Thesis/Project Title: Segmentation of Cardiac Ultrasound Images Using Deep Learning Present Position: Graduate Student
2017/4 - 2018/4 Co-Supervisor	Melissa Woghiren (In Progress) , University of Alberta Thesis/Project Title: Stroke Identication using Multi-sensory Data Present Position: Graduate Student
2016/4 - 2018/4 Principal Supervisor	Ian Watts (In Progress) , University of Alberta Thesis/Project Title: Augmented Reality using Direct Projection Present Position: Graduate Student
2016/4 - 2018/4 Principal Supervisor	Mike Feist (In Progress) , University of Alberta Thesis/Project Title: Optical Flow using Unsupervised Deep Learning Present Position: Graduate Student
2015/9 - 2017/12 Co-Supervisor	Nazanin Tahmasebi (Completed) , University of Alberta Thesis/Project Title: Real-time MRI Registration Present Position: Student
2015/9 - 2017/10 Co-Supervisor	Nehan Khan (Completed) , University of Alberta Thesis/Project Title: Algorithms for Multiview Ultrasound Using Magnetic Trackers Present Position: Graduate Student
2015/9 - 2016/6 Co-Supervisor	Simon Byrns (Completed) , University of Alberta Thesis/Project Title: Sensor-based Open Surgery Task Analysis Present Position: Graduate Student
2015/5 - 2016/9 Co-Supervisor	David Pinzon (Completed) , University of Alberta Thesis/Project Title: Haptic Guidance in Surgical Training Present Position: Graduate Student
2015/1 - 2018/4 Principal Supervisor	Shrimanti Ghosh (Completed) , University of Alberta Thesis/Project Title: Continuous Blood Pressure Prediction from Pulse Transit Time Using ECG and PPG Signals Present Position: Graduate Student
2014/9 - 2016/10 Co-Supervisor	Ray Yang (Completed) , University of Alberta Thesis/Project Title: CUDA-based Monte Carlo Simulation for Radiation Therapy Dosimetry Present Position: Graduate Student
2013/9 - 2015/9 Co-Supervisor	Usman Aziz (Completed) , University of Alberta Thesis/Project Title: REAL-TIME FREE VIEWPOINT VIDEO SYSTEM BASED ON A NEW PANORAMA STITCHING FRAMEWORK Present Position: Research Engineer
2013/6 - 2018/9 Co-Supervisor	Rositsa Bogdanova (In Progress) , University of Alberta Student Degree Expected Date: 2017/9 Thesis/Project Title: Three-Dimensional Eye Tracking in a Surgical Scenario Present Position: Graduate Student

2012/9 - 2014/2 Principal Supervisor	Kyrylo Shegeda (Completed) , University of Alberta Thesis/Project Title: A GPU-based Framework for Real-time Free Viewpoint Television Present Position: Programmer

Doctorate [n=13]

2018/9 - 2023/4 Academic Advisor	Shrimanti Ghosh (In Progress) , University of Alberta Student Degree Expected Date: 2022/4 Thesis/Project Title: Segmentation of Muscles and Bones of Open MR Images Using Neural Networks Present Position: Grad Student
2018/9 - 2023/4 Principal Supervisor	Thea Wang (In Progress) , University of Alberta Student Degree Expected Date: 2022/4 Thesis/Project Title: Surgical Training Using Proxy Haptic Present Position: Grad Student
2017/4 - 2021/6 Principal Supervisor	Hong Zu Li (In Progress) , University of Alberta Student Degree Expected Date: 2021/6 Thesis/Project Title: Early Detection Failing Heart Conditions Using Machine Learning Present Position: Graduate Student
2016/10 - 2019/6 Co-Supervisor	Ray Yang (In Progress) , University of Alberta Student Degree Expected Date: 2019/6 Thesis/Project Title: Radiation Dose Calulation Using None Monte Carlo Simulation Present Position: Graduate Student
2016/9 - 2020/4 Co-Supervisor	Deepa Krishnaswamy (In Progress) , University of Alberta Student Degree Expected Date: 2016/9 Thesis/Project Title: Segmentation of cadiac echo using deeo learning Present Position: Student
2014/4 - 2018/4 Co-Supervisor	Nathanial Maeda (Completed) , University of Alberta Thesis/Project Title: Real-time Spine Simulation using GPU Present Position: Graduate Student
2013/5 - 2016/10 Co-Supervisor	Daniel Oloumi (Completed) , University of Alberta Thesis/Project Title: UWB Microwave Tomography for Breast Cancer Detection Present Position: Graduate Student
2012/9 - 2017/1 Principal Supervisor	Amir Sharifi (Completed) , University of Alberta Thesis/Project Title: Enhancing Visual Perception in Interactive Direct Volume Rendering of Medical Images Present Position: Programmer Microsoft Vancouver
2011/9 - 2014/12 Co-Supervisor	Jenifer Cifuentes (Completed) , National University of Colombia Thesis/Project Title: Development of a New technique for Objective Assessment of Gestures in Minimally Invasive Surgery Present Position: Graduate Student
2010/9 - 2014/10 Co-Supervisor	Michelle Annett (Completed) , University of Alberta Thesis/Project Title: The Fundamental Issues of Pen-Based Interaction with Tablet Devices Present Position: Postdoc, University of Waterloo
2010/9 - 2014/9 Co-Supervisor	Fraser Anderson (Completed) , University of Alberta Thesis/Project Title: Gesture Learning in Human Computer Interaction Present Position: Project Manager at AutoCAD

2009/9 - 2015/12 Principal Supervisor	Qiong Wu (Completed) , University of Alberta Thesis/Project Title: EyeDentifyIt:An Unified Image Tagging System Driven by Image-Click-Ads Framework Present Position: Graduate Student
2009/9 - 2015/6 Principal Supervisor	Idanis Diaz (Completed) , University of Alberta Thesis/Project Title: Atlas to Patient Registration with Brain Tumor Based on a New Mesh-free Method Present Position: Assistant Professor at Magdalena University Colombia

Post-doctorate [n=5]

2017/9 - 2019/8 Co-Supervisor	Daniel Oloumi (In Progress) , University of Calgary Thesis/Project Title: Hardware and Software Development for UWB Microwave Tomography Present Position: Postdoc in Calgary
2017/9 - 2018/12 Co-Supervisor	Abhilash Hareendranathan (Completed) , University of Alberta Thesis/Project Title: Development of Ultrasound Multiview Algorithms Present Position: Postdoc at SERVIER Lab.
2017/7 - 2018/7 Co-Supervisor	Taylor Lamb (Completed) , University of Alberta Thesis/Project Title: Clinical Applications of Multi-view Ultrasound Present Position: Postdoc
2014/4 - 2016/3 Co-Supervisor	Kevin Chan (Completed) , University of Alberta Thesis/Project Title: UWB Microwave Computerized Tomography Present Position: Postdoc
2013/4 - 2014/3 Principal Supervisor	Mohamed Ben Salah (Completed) , University of Alberta Thesis/Project Title: Knee Kinematics Estimation for Subjects with Patellofemoral Problems Present Position: Posdoc at INTEL

Research Associate [n=4]

2017/4 - 2018/5 Principal Supervisor	Vaibhav Dixit (Completed) , University of Alberta Thesis/Project Title: Programmer for MedROAD Project Present Position: Programmer
2017/4 - 2020/3 Principal Supervisor	Muhammad Zeshan (Completed) , University of Alberta Thesis/Project Title: Programmer for MedROAD Project Present Position: Programmer
2015/9 - 2020/12 Principal Supervisor	William Mott (Completed) , University of Alberta Thesis/Project Title: Software Architect for MedROAD and MedBIKE Projects Present Position: Software Architect
2014/9 - 2020/12 Principal Supervisor	Stephanie Schaeffer (In Progress) , University of Alberta Thesis/Project Title: Software Architect for MedROAD and MedBIKE Projects Present Position: Software Architect

Event Administration

2016/5 - 2017/6	General Chair, Joint Atificial Intelligence, Graphic Interface, and Computer Robotics Vision Conferences, Conference, 2017/5 - 2017/6

| 2014/5 - 2015/9 | Conference Chair, CAC 2015 Conference Workshop: 3D Scanning for Conservators, Workshop, 2015/5 - 2015/5 |

Editorial Activities

2017/5 - 2020/12	Associate Editor, Journal of Radiology and Medical Imaging, Journal
2015/3 - 2019/3	Member of Editorial Board, Frontiers in ICT, Journal
2015/7 - 2018/5	Member of the Editorial Board, Journal of Computational Science and Informatics, Journal

Expert Witness Activities

| 2013/6 - 2014/1 | Expert Witness, Copyright Infringement between Panthera and Nobel Biocad, Canada, Montreal
Did the comparison between the two software looking for copyright infringement |

Committee Memberships

2010/7 - 2020/7	Committee Member, Faculty of Science representative at the College Saint-Jean dean council meetings, University of Alberta
2017/6 - 2020/6	Committee Member, CIHR Colledge of Reviewers, CIHR
2019/4 - 2020/4	Committee Member, Faculty of Science Disciplinary Committee, University of Alberta
2015/4 - 2020/4	Committee Member, Scientific Council of CRIM in Montreal, Computer Research Institute of Montréal
2012/1 - 2019/4	Committee Member, FQRNT Team Grant Selection Commitee, Fonds de recherche du Québec - Nature et technologies (FRQNT)
2010/4 - 2018/4	Committee Member, Department of Computing Science Hiring Committee, University of Alberta
2014/7 - 2017/7	Committee Member, Faculty of Science representative at the dean of medicine council meetings, University of Alberta
2011/7 - 2016/7	Committee Member, Member of the Faculty of Science Science Advisory Selection Committee, University of Alberta
2013/9 - 2015/2	Committee Member, CHRP Selection Commitee, Natural Sciences and Engineering Research Council of Canada (NSERC)

Presentations

1. (2020). Quantum Neural Network: A Review of the State-of-the-Art. NRC Quantum Workshop, Ottawa, Canada
   Main Audience: Knowledge User
   Invited?: Yes, Keynote?: Yes

2. (2020). MedROAD: a Next Generation e-Health System for COVID-19. Alberta AI Association, Edmonton, Canada
   Main Audience: Knowledge User
   Invited?: Yes, Keynote?: Yes

3. (2020). Modernizing Canada's Healthcare System Using AI and Mixed Reality. Know Thyself Seminars, Edmonton, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

4. (2019). A Brief Introduction to Quantum Computing. Honor Seminar, Edmonton, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

5. (2019). Augmented and Virtual Reality Applications for Surgical Planning and Training. IST Keynote Tutorial, Edmonton, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

6. (2019). Artificial Intelligence and AR/VR for Healthcare. University of Alberta ALUMNI Association, Victoria and Vancouver, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

7. (2019). MedROAD a Next Generation e-Health System. ASTEC Artificial Intelligence is changing the world, Calagary, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

8. (2019). Artificial Intelligence and AR/VR for Healthcare. Clarence White Conference, Red Deer, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

9. (2019). Modernizing Canada's Healthcare System Using AI and Mixed Reality. PROBUS, Edmonton, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

10. (2018). Issues and Challenges of Large Scale Pervasive Health Tele-Monitoring. Workshop on Big-Data, Toronto, Canada
    Main Audience: Knowledge User
    Invited?: Yes, Keynote?: Yes

11. (2018). VR and GPU for Big Data Analytics. VR/AR Association, Edmonton, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

12. (2018). VR and Visual Analytics for Big Medical Data. CRIM Seminars, Montreal, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

13. (2017). New Trends in Virtual and Augmented Reality. Athabasca University Workshop, Edmonton, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: Yes

14. (2017). Demontration of MedBIKE. CISCO Connect Conference, Toronto, Canada
    Main Audience: Knowledge User
    Invited?: Yes, Keynote?: No

15. (2017). MedROAD: Telemedicine for all. Health Innovation North and South: Access, Technology and Delivery-Panel Discussion, Edmonton, Canada
    Main Audience: General Public
    Invited?: Yes, Keynote?: No

16. (2017). A Review of CISCO Systems Chair in Healthcare Solutions. Presented at the Computer Research Institute of Montréal, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: Yes

17. (2016). MedROAD: a Remote Monitoring System for the Care of Elderly Canadians. Global Healthcare Summit, Calgary, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No

18. (2016). In-Vivo Patellar Motion under a Dynamic Weight-bearing Condition in Individuals with Patellofemoral Pain Syndrome. American Medical Scociety for Sports Medicine, Washington, United States
Main Audience: Researcher
Invited?: Yes, Keynote?: No

19. (2016). Project MedROAD. 12th Annual Summit on Mobile Healthcare, Toronto, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: Yes

20. (2016). Free-viewpoint TV Using Real-time Panorama. GTC Conference, San Jose, United States
Main Audience: Knowledge User
Invited?: No, Keynote?: No

21. (2016). Sonification in Science. Symposium on Exhibiting Sound organized by the Faculty of Music, Edmonton, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No

22. Pierre Boulanger. (2015). Is Multi-view Video the Future of IPTV?. Telus Technology Days, Edmonton, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No

23. Pierre Boulanger and Kumar Punithakumara, Michelle Noga. (2015). A GPU Accelerated Cardiac Image Segmentation Approach using Diffeomorphic Registration. Mazakowski Cardiac Science Day, Edmonton, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No

24. Pierre Boulanger. (2015). Medbike: A Technological Solution For Poor Patient Participation In Cardiac Rehabilitation. Mazakow ski Cardiac Science Day, Edmonton, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No

25. (2015). Remote Monitoring System Using MedROAD. Ward of the 21 Century, Calgary, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No

26. (2015). Virtual Reality from Dream to Reality. VR Nights organized by the Faculty of Medicine, Edmonton, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: Yes

27. Pierre Boulanger. (2015). Virtual and Augmented Reality: In Pursuit of an Elusive Dream. VR After Dark, Edmonton, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No

28. (2014). From Medical Imaging to Patient Specific Modeling for Augmented Reality MIS. Medical Lecture Series, Quebec City, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: Yes

29. Pierre Boulanger. (2014). New Information and Communication Technologies to Improve Medical Practice and the Quality of Care. Advanced Digital Technology Conference for Head and Neck, Beijing, China
Main Audience: Knowledge User
Invited?: Yes, Keynote?: Yes

30. (2014). Recent Development in Closed-loop Visual Simulations. 11th World Congress on Computational Mechanics, Barcelona, Spain
Main Audience: Researcher
Invited?: Yes, Keynote?: No

Publications

Journal Articles

1. Nazanin Tahmasebi, Pierre Boulanger, Jihyun Yun, Gino Fallone, Michelle Noga, Kumaradevan Punithakumar. (2020). Real-Time Lung Tumor Tracking Using a CUDA Enabled Nonrigid Registration Algorithm for MRI. IEEE Journal of Translational Engineering in Health and Medicine. : 1-8.
Published
Refereed?: Yes, Open Access?: No

2. Emilie Robertson, Peter Kwan, Gorman Louie, Pierre Boulanger, Daniel Aalto. (2020). Skeletal Deformity in Patients With Unilateral Coronal Craniosynostosis: Perceptions of the General Public. Craniomaxillofacial Trauma & Reconstruction. 13(2): 122-129.
Published
Refereed?: Yes, Open Access?: No

3. Emilie Robertson, Peter Kwan, Gorman Louie, Pierre Boulanger, Daniel Aalto. (2020). Test-retest validation of a cranial deformity index in unilateral coronal craniosynostosis. Computer Methods in Biomechanics and Biomedical Engineering. : 1-13.
Published
Refereed?: Yes, Open Access?: No

4. Hongzu Li, Pierre Boulanger. (2020). A Survey of Heart Anomaly Detection Using Ambulatory Electrocardiogram (ECG). Sensors. 20(5): 1461.
Published
Refereed?: Yes, Open Access?: Yes

5. Michael Khoury, Devin B Phillips, Peter W Wood, William R Mott, Michael K Stickland, Pierre Boulanger, Gwen R Rempel, Jennifer Conway, Andrew S Mackie, Nee S Khoo. (2020). Cardiacrehabilitation in the paediatric Fontan population: development of a home-basedhigh-intensity interval training programme. Cardiology in the Young. : 1-8.
Published
Refereed?: Yes, Open Access?: No

6. Daniel Oloumi, Robert SC Winter, Atefeh Kordzadeh, Pierre Boulanger, Karumudi Rambabu. (2019). Microwave imaging of breast tumor using time-domain UWB circular-SAR technique. IEEE Transactions on Medical Imaging. 39(4): 934-943.
Published
Refereed?: Yes, Open Access?: No

7.   J. Cifuentes, M. T. Pham, P. Boulanger, R. Moreau, F. Prieto. (2018). Towards a Classification of Surgical Skills using Affine Velocity. IET Science, Measurement & Technology. 12(4): 548 – 553.
      Accepted
      Refereed?: Yes

8.   K. Chan, K. Rambabu, and P. Boulanger. (2018). Open Ended Waveguide Dielectric Probe Using Time Domain Measurements. Microwave and Optical Technology Letters. 60(5): 1108-1112.
      Accepted
      Refereed?: Yes

9.   J. Cifuentes, M.T. Pham, P. Boulanger, R. Moreau, F. Prieto. (2018). Gesture Segmentation and Classification Using Affine Speed and Energy. Proceedings of the Institution of Mechanical Engineers. Part H, Journal of engineering in medicine. 232(6): 588-596.
      Accepted
      Refereed?: Yes

10.   R.C. Tarraf, E. Suter, M. Arain, A. Birney, O. Boakye, P. Boulanger, C.A. Sadowski. (2018). Using Integrated Technology to Create Quality Care for Older Adults: A Feasibility Study. Informatics for Health and Social Care. 43(1): 1-16.
      In Press
      Refereed?: Yes, Open Access?: Yes

11.   L. Albrecht, P.W. Wood, M. Fradette. F.A. McAlister, D. Rabi, P. Boulanger, R. Padwal. (2018). Usability and Acceptability of a Home Blood Pressure Telemonitoring Device in Community Dwelling Seniors with Hypertension: A qualitative study. JMIR Aging. 1(2): 15.
      Accepted
      Refereed?: Yes

12.   A.R. Hareendranathan, M.L. Noga, P. Boulanger, K. Punithakumar. (2018). Random Walker Framework for Sensor-based Echocardiography Fusion. IEEE Access. 99(1): 10.
      Accepted
      Refereed?: Yes

13.   F. Esfandiarpour, C.M. Lebrun, S. Dhillon, P. Boulanger. (2018). In-vivo patellar tracking in individuals with patellofemoral pain and healthy individuals: Patellar Tracking and Patellofemoral Pain. J. Orthopedic Research. 23(20): 25.
      Accepted
      Refereed?: Yes

14.   N. Tahmasebi, P. Boulanger, J. Yun. G. Fallone, K. Punithakumar. (2018). Tracking Tumor Boundary Using Point Correspondence for Adaptive Radio Therapy. Computer Methods and Programs in Biomedicine. 25: 1-26.
      Accepted
      Refereed?: Yes, Open Access?: No

15.   K. Punithakumar, P. Boulanger, and M.Noga. (2017). A GPU-Accelerated Deformable Image Registration Algorithm with Applications to Right Ventricular Segmentation. IEEE Access. 5: 20374 - 20382.
      Accepted
      Refereed?: Yes

16.   K. Punithakumar, A. Hareendranathan, A. McNulty, M. Biamonte, A. He, M. Noga, P. Boulanger, and H. Becher. (2017). **Multiview 3D echocardiography fusion withbreath-hold position tracking using an optical tracking system**. Ultrasound in Medicine and Biology. 42(8): 15.
      Accepted
      Refereed?: Yes

17. K. M. Chan, D. Oloumi, P.Boulanger, and K.Rambabu. (2017). UWB Antenna Design for Dispersion Free Time Synchronized Pulse Radiation. IEEE Transactions on Antennas and Propagation. 99: 8 pages.
   Accepted
   Refereed?: Yes, Open Access?: No

18. P. Wood, P. Boulanger, and R. Padwal. (2017). Home Blood Pressure Telemonitoring: Rationale for Use, Required Elements, and Barriers to Implementation in Canada. The Canadian journal of cardiology. 33(5): 15.
   Accepted
   Refereed?: Yes

19. E. Suter, R.C. Tarraf, O. Boakye, P. Boulanger, A. Birney, C.A. Sadowski, G. Gill, and K. Mrklas. (2017). Using eTechnology to Create Quality Care for Seniors. International Journal of Integrated Care. 17(5): 1.
   Accepted
   Refereed?: Yes, Open Access?: Yes

20. M. Al-Saleh, K. Punithakumar, M. Lagravere, P. Boulanger, J. Jaremko, J. Wolfaardt, P. Major, and H. Seikaly. (2017). Three-Dimensional Morphological Changes of Thetemporomandibular Joint and Functional Effects After Mandibulotomy. Journal of Otolaryngology-Head & Neck Surgery. 46(8): 14.
   Accepted
   Refereed?: Yes

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34. R. Taylor , G. Schofield, J. Shearer, P. Wright, P. Boulanger, and P. Olivier. (2014). Nightingallery: theatrical framing and orchestration in participatory performance. Journal Personal and Ubiquitous Computing. 11: 10 pages.
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Refereed?: Yes

Book Chapters

1. Angel R Licona, Fei Liu, David Pinzon, Ali Torabi, Pierre Boulanger, Arnaud Lelevé, Richard Moreau, Minh Tu Pham, Mahdi Tavakoli. (2020). Applications of Haptics in Medicine. Springer, Cham. Haptic Interfaces for Accessibility, Health, and Enhanced Quality of Life. : 183-214.
Published, Springer
Refereed?: Yes

2. Pierre Boulanger, William Mott, Stephanie Schaeffer, Peter W Wood, Raj Padwal, Paolo Raggi. (2019). MedBike: Virtual Reality for Remote Cardiac Rehabilitation. Alireza Ziaei. Assistive & Rehabilitation Engineering. : 21 pages.
   In Press, IntechOpen
   Refereed?: Yes

3. P. Boulanger, A. Pournajib, W. Mott, S. Schaeffer. (2018). A Low-Cost Virtual Reality Bike for Remote Cardiac Rehabilitation. Patrick Bourdot. Lecture Notes in Computer Science: Virtual Reality and Augmented Reality. : 15.
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   Refereed?: Yes

4. K. Shegeda and P. Boulanger. (2014). A GPU-based Real-time Algorithm for Virtual Viewpoint Rendering from Multi-video. Prof. Dr. Nadia Magnenat-Thalmann. GPU Computing and Applications. Computer Science Series: 10 pages.
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Conference Publications

1. Yiran Thea Wang, Kumaradevan Punithakumar, Pierre Boulanger. (2020). The impact of color coding in Virtual Reality navigation tasks. Optical Architectures for Displays and Sensing in Augmented, Virtual, and Mixed Reality (AR, VR, MR). International Society for Optics and Photonics, San Fancisco, United States (11310)
   Paper
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   Refereed?: Yes, Invited?: No

2. Mahdi Rahmani Hanzaki and Pierre Boulanger. (2020). Proxy Haptics for Surgical Training. Computers and Graphics (C&G) Special Issue. SVR 2020 : 22nd Symposium on Virtual and Augmented Reality, Porto de Galinhas, Brazil (1-10)
   Conference Date: 2020/11
   Paper
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   Refereed?: Yes, Invited?: No

3. Shrimanti Ghosh, Nilanjan Ray, Pierre Boulanger, Kumaradevan Punithakumar, Michelle Noga. (2020). Automated Left Atrial Segmentation from Magnetic Resonance Image Sequences Using Deep Convolutional Neural Network with Autoencoder. 2020 IEEE 17th International Symposium on Biomedical Imaging (ISBI). 2020 IEEE 17th International Symposium on Biomedical Imaging (ISBI), Iowa City, IA, United States (1756-1760)
   Conference Date: 2020/4
   Paper
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   Refereed?: Yes, Invited?: No

4. Mohsen Soltanpour, Russell Greiner, Pierre Boulanger, Brian Buck. (2019). Ischemic Stroke Lesion Prediction in CT Perfusion Scans Using Multiple Parallel U-Nets Following by a Pixel-Level Classifier. 2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BIBE), Athens, Greece (957-963)
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5. S. Ghosh, A. Banerjee, N. Ray, P.W. Wood, P. Boulanger, R. Padwal. (2018). Using Accelerometric and Gyroscopic Data to Improve Blood Pressure Predictionfrom Pulse Transit Time Using Recurent Neural Network. IEEE International Conference on Acoustics, Speech and Signal Processing, Calgary, Canada
Conference Date: 2018/4
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Refereed?: Yes, Invited?: No

6. S. Ghosh, P. Boulanger, S.T. Acton, S. Blemker, N. Ray. (2018). Automated 3D muscle segmentation from MRI data using convolutionalneural network. IEEE SigPort, Beijing, China
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7. P. Boulanger, A. Pournajib, L. Machado, W. Mott, and S. Schaeffer. (2017). A Low-cost Virtual Reality Bike for Remote Cardiac Rehabilitation. Euro VR2017, Laval, France (13 pages)
Conference Date: 2017/12
Paper
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Refereed?: Yes, Invited?: No

8. I. Watts, P. Boulanger, and G. Kawchuk. (2017). ProjectDR: Augmented Reality System for Displaying Medical Images Directly onto a Patient. ACM VRST 2017, Gothenburg, Denmark (2 pages)
Conference Date: 2017/11
Poster
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Refereed?: Yes, Invited?: No

9. S. Ghosh, A. Banerjee, N. Ray, P.W. Wood, P. Boulanger, and R. Padwal. (2017). Accuracy Analysis of Blood Pressure Prediction from ECG and PPG signals Using Pulse Transit Time. Canadian Hypertension Congress Hypertension Canada, Toronto, Canada (188-191)
Conference Date: 2017/10
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Refereed?: Yes, Invited?: No

10. S. Ghosh, P. Boulanger, S.T. Acton, S. Blemker, and N. Ray. (2017). A Structured Deep-learning Based Approach for the Automated Segmentation of Human Leg Muscle from 3D MRI. 2017 IEEE International Conference on Image Processing, Beijing, China (5 pages)
Conference Date: 2017/9
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Refereed?: Yes, Invited?: No

11. J. Cifuentes, M.T. Pham, R. Moreau, F. Prieto, and P. Boulanger. (2017). Surgical Gesture Classification using Dynamic Time Warping and Affine Velocity. 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'17)., Jesu Island, Korea, Republic of (4 pages)
Conference Date: 2017/7
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Refereed?: Yes, Invited?: No

12. N. Tahmasebi, P. Boulanger, and K. Punithakumar. (2017). Parallel Implementation of a Nonrigid Image Registration Algorithm for Lung Tumor Boundary Tracking in Quasi Real-time MRI. 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'17), Jesu Island, Korea, Republic of (4 pages)
Conference Date: 2017/7
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Refereed?: Yes, Invited?: No

13. S. Ghosh, N. Ray, and P. Boulanger. (2017). A Structured Deep-learning Based Approach for the Automated Segmentation of Human Leg Muscle from 3D MRI. Canadian Computer and Robot Vision Conference, Edmonton, Canada (8 pages)
Conference Date: 2017/5
Paper
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Refereed?: Yes, Invited?: Yes

14. G. Kawchuk, P. Boulanger, I. Watts, and M. Feist. (2017). Can a Patient's Skin Be Used to Display Anatomically Correct Diagnostic Images?. DC2017 American Chiropractic Association, Washington, United States (2 pages)
Conference Date: 2016/12
Poster
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Refereed?: Yes, Invited?: No

15. K. Punithakumar, A. R. Hareendranathan, R. Paakkanen, N. Khan, M. Noga, P. Boulanger, and H. Becher. (2016). Multiview Echocardiography Fusion using an Electromagnetic Tracking System. IEEE Proceedings. IEEE EMBC, Miami, United States (4 pages)
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17. S. Ghosh, A. Banerjee, N. Ray, P. W Wood, P. Boulanger, and R. Padwal. (2016). Continuous Blood Pressure Prediction from Pulse Transit Time Using ECG and PPG Signals. IEEE Proceedings. IEEE EMBC, Miami, United States (4 pages)
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18. A.R. Hareendranathan, M. Hanbidge, A. He, M. Noga, P. Boulanger, H. Becher, and K. Punithakumar. (2016). Patient Movement Compensation for 3D Echocardiography Fusion. 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Miami, United States (4 pages)
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19. S. Ghosh, N. Ray, P. Wood, P. Boulanger, R. Padwal. (2016). Pulse Tansit Time Computation Using Signal Sparcity for Continuous Blood Pressure Prediction. IEEE. IEEE Engineering in medicine and Biology Conference, Miami, United States (4 pages)
Conference Date: 2016/6
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20. C. M. Lebrun, F. Esfandiarpour, S. Dhillon, and P. Boulanger. (2016). In-Vivo Patellar Motion under a Dynamic Weight-bearing Condition in Individuals with Patellofemoral Pain Syndrome. Proceedings of ASSM. American Society of Sports Medicine, Denver, United States
Conference Date: 2016/6
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21. M.U. Aziz and P. Boulanger. (2016). Video-rate Panorama for Free-viewpoint TV. Canadian Computer Vision and Robotics Conference, Victoria, Canada (8 pages)
Conference Date: 2016/6
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Refereed?: Yes, Invited?: No

23. D. Oloumi , K. Rambabu, and P. Boulanger. (2015). Tracking a Biopsy Needle Inside a Breast Using UWB Circular- SAR. IEEE AP-S Symposium on Antennas and Propagation, Vancouver, Canada
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24. K. Punithakumara, M. Noga, and P. Boulanger. (2015). A GPU Accelerated Moving Mesh Correspondence Algorithm with Applications to RV Segmentation. IEEE Proceedings. 37TH Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italy (4 pages)
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Conference Date: 2015/7
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Refereed?: Yes, Invited?: No

26. I. Diaz and P. Boulanger. (2015). Atlas to Patient Registration with Brain Tumor Based on a Mesh-free Method. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italy
Conference Date: 2015/7
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27. D. Oloumi , K.Rambabu, and P. Boulanger. (2015). Breast Tumor Detection Using UWB Circular Breast Tumor Detection Using UWB Circular. Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italy
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30. C. Lebrun, F. Esfandiarpour, S. Dhillon, and P. Boulanger. (2015). Case Analysis of the Real-time Patellofemoral Joint Motion in Patellofemoral Pain Syndrome using an Advanced Methodology. Online. American Medical Society for Sports Medicine,
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Refereed?: Yes, Invited?: Yes

31. K. Punithakumar, M. L Noga, and P. Boulanger. (2015). A GPU Accelerated Cardiac Image Segmentation Approach using Diffeomorphic Registration. NVIDIA GPU Technology Conference 2015, Palo Alto, United States (2 pages)
Conference Date: 2015/3
Poster
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Refereed?: Yes, Invited?: No

32. K. Punithakumar, M. Noga, P. Boulanger, I. Ben Ayed, M. Afshin, A.Goela, A. Islam, and S. Li. (2014). Detecting Left Ventricular Impaired Relaxation Using MR Imaging. Online. Biomedical and Health Informatics (BHI), Valencia, Spain
Conference Date: 2015/9
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Conference Date: 2014/10
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34. M. Al-Salek, K. Punithakumar, P. Boulanger, and P. Major. (2014). Assessing The Accuracy Of The MRI-CBCT Rigid Registration: An In-vitro Study. Advanced Digital Technology Conference in Head and Neck, La Jolla, United States (1 page)
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35. L. Steen, P. Boulanger, B.Hodgetts, J. Wolfaardt, E. Wright, and B. Zheng. (2014). Development of a Practical Simulator for Training Nasal Endoscopy Skills in Otolaryngology Residency Programs. Online. Advanced Digital Technology Conference in Head and Neck Surgery, Beijing, China (2 pages)
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36. J. Cifuentes, P. Boulanger, M. Tu Pham, R. Moreau, and F. Prieto. (2014). Automatic Gesture Analysis Using Constant Affine Speed. IEEE EMBC Proceedings. 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'14), Chicago, (4 pages)
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37. P. Boulanger. (2014). Recent Development in Closed-loop Visual Simulations. Proceeding of WCCM 2014. 11th World Congress on Computational Mechanics, Barcelona, Spain (4 pages)
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41. M. Garcia, J. Duque, and P. Boulanger. (2014). Computational Steering of CFD Simulations inside Grid Computing Environments. Online. Virtual Concept Iinternational Workshop on Innovation in Design and Manufacture, Medellin, Colombia (4 pages)
    Conference Date: 2014/3
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    Refereed?: Yes, Invited?: Yes

42. P. Boulanger and K. Shegeda. (2014). A GPU-based Free-viewpoint Video System for Surgical Training. Proceedings of GTC 2014 Conference. GPU Technology Conference, San Jose, (8 pages)
    Conference Date: 2014/3
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    Refereed?: Yes, Invited?: No

43. K. Punithakumara, M. Noga, and P. Boulanger. (2014). A GPU Accelerated Cardiac Image Segmentation Approach using Diffeomorphic Registration. Online. NVIDIA GPU Technology Conference 2015, San Jose, United States
    Conference Date: 2014/3
    Poster
    Published
    Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. System and Method for Minimally Invasive Surgical Training Using Haptic and Gaze Guidance. United States. 62/394,916. 2017/06/13.
   Patent Status: Allowed
   Inventors: David Pinzon, Pierre Boulanger, Bin Zheng

2. Surface Modeling of a Segmented Echogenic Structure for Detection and Measurement of Anatomical Anomalies. Canada. PCT/CA2016/050614. 2016/09/02.
   Patent Status: Granted/Issued
   Inventors: J. Jaramenko, A. Hareendranathan, M. Mabee, R. Thompson, P. Boulanger, Kumar Punithakumar

3. Distortion Less UWB Pulse Antenna. United States. 2,938,901. 2016/08/11.
   Patent Status: Pending
   Inventors: K. Chan, R. Karumudi, and P. Boulanger

4. System and Method for High-Quality Real-Time Foreground/Background Seperation in Tele-Conferencing Using Self-Registered Color/Infrared Input Images and Closed-Form Nartural Image Matting Technique. United States. 12/727,654. 2016/02/18.
   Patent Status: Withdrawn
   Inventors: Q. Wu and P. Boulanger

5. Apparatus and Method for Generating a Fused Scan Image of a Patient. Canada. PCT/CA2016/051475. 2017/02/01.
    Patent Status: Granted/Issued
    Year Issued: 2019
    Inventors: Kumaradevan PUNITHAKUMAR, ; Harald BECKER, Pierre BOULANGER, Michelle NOGA, and Abhilash HAREENDRANATHAN

6. System and Method for Capturing Spatially and Temporally Coherent Eye Gaze and Hand Data During Performance of a Manual Task. United States. US 10,433,725 B2. 2016/09/15.
    Patent Status: Granted/Issued
    Year Issued: 2019
    Inventors: Simon Byrns, Michael Feist, Bin Zheng, Pierre Boulanger

7. Surface modeling of a segmented echogenic structure for detection and measurement of anatomical anomalies. United States. 10405834. 2015/06/15.
    Patent Status: Granted/Issued
    Year Issued: 2019
    Inventors: J.L. Jaremko, A. Hareendranathan, M. Mabee, R. Thompson, and P. Boulanger

8. Multiview 3D Echocardiography Fusion with Respiratory Gating. United States. 62/267,054. 2015/12/14.
    Patent Status: Granted/Issued
    Year Issued: 2017
    Inventors: K. Punithakumar, H. Becher, P. Boulanger, M. Noga, and A. Hareendranathan

Licenses

1. MedBIKE Software
    Granted
    Filing Date: 2020/02/06
    Sofware licenced to Naiad Lab Inc.

2. MedROAD Software
    Granted
    Filing Date: 2020/01/01
    MedROAD Software commercialized by Naiad Lab Inc

Registered Copyrights

1. MedROAD System
    First Fixation
    Year Issued: 2020
    Filing Date: 2019/11/01

2. MedBIKE System
    First Fixation
    Year Issued: 2020
    Filing Date: 2019/10/01