

CURRICULUM VITAE¹

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¹ last updated August 2016

1 BACKGROUND

1.1 Education

- October 2001- April 2003
Postdoctoral fellowship in the Computer Vision and Systems Laboratory, Laval University
Project: *3D Visualization of anatomical structures from MRI Images*
- December 2000
Ph.D. in Electrical Engineering, Polytechnic University of Bucharest, Romania
Dissertation: *Contributions to Pattern Recognition in Medical Imaging*
- September 1992
Engineering Diploma in Electronics
Polytechnic University of Bucharest, Romania
- March 1992- August 1992
Research internship at University Joseph Fourier, Grenoble, France
Laboratory of Imaging, Modeling and Cognition Techniques (TIMC).

1.2 Employment History

- July 2009- present
Associate Professor, Electrical and Computer Engineering (cross-listed with Computer Science), University of Victoria (BC), Canada
- August 2005-June 2009
Assistant Professor, Electrical and Computer Engineering (cross-listed with Computer Science), University of Victoria (BC), Canada
- May 2003-July 2005
Assistant Professor, Electrical and Computer Engineering, Laval University (Quebec), Canada
- October 2001-April 2003
Postdoctoral fellow, Electrical and Computer Engineering, Laval University (Quebec), Canada
- January 1999-June 2001
Lecturer, University "Ovidius", Romania

2 RESEARCH

2.1 Most Significant Research Contributions

My research belongs to the field of Computer Vision. From a practical standpoint, my contributions to this field involve investigating research questions that are closely linked to societal needs.

The nature of the research problems that I have addressed involves a substantial theoretical content that transcends the limits of particular applications. According to Google Scholar, my research papers have received 379 citations (261 since 2011). The remainder of the section outlines my main contributions to environmental monitoring, document image analysis, medical image analysis, and video surveillance.

1.1 Environmental monitoring

Change detection in high-resolution oblique photographs of mountain habitats

This project is an interdisciplinary initiative involving experts in Environmental Studies. They created the Mountain Legacy database <http://mountainlegacy.ca>, an impressive collection of high resolution mountain photographs acquired in the Rocky Mountains at the beginning of the 20th century, paired with repeat photographs acquired in recent field trips. The focus is on automatic change detection between historic and repeat images using computer vision techniques. An experimental dataset consisting of historic and repeat images accompanied by ground truth manual segmentation into 8 habitat categories, and by a baseline algorithm based on texture analysis and supervised machine learning techniques have been proposed in [C11], published in the proceedings of the 2015 IEEE Winter Conference of Applications in Computer Vision (WACV). Using the same experimental dataset, we have also proposed a method for visualizing the spatial distribution of classes for a multi-class image segmentation problem [C10]. This method, published by the Eurographics Association in the 2015 proceedings of the Workshop on Visualization in Environmental Sciences (EnvirVis), builds class-specific distribution maps, which enable spatial change visualization, as well as the computation of prior class probabilities for statistical scene segmentation purposes.

Detection and identification of animals and/or their behavior from visual imagery

Recent climate changes influence significantly the distribution and behavioral patterns of many terrestrial and aquatic species. It is therefore imperative to develop novel techniques to identify and track species at risk, as well as potential modifications in their behavior, which may be triggered by environmental changes. Our paper [C16] (published in the 2014 IEEE Canadian Conference on Computer and Robot Vision) discusses a method for re-identifying individual pond turtles using images of their plastron; the approach is based on the analysis of convexities-concavities of the contours on the plastron, combined with a neural network approach. Changes in the behavior of wild fish caused by exposure of their natural habitat to boat noise are studied in [C14], published in the 2015 ACM proceedings of Environmental Multimedia Retrieval workshop organized in conjunction with the International Conference of Multimedia Retrieval. To the best of our knowledge, this is the first paper to propose an automated method to analyze subtle movements of a highly territorial animal in its natural habitat. The analysis of fish

behavior uses similarity-based periodicity detection combined with KNN classifiers. Detection of sea stars from underwater images using saliency-based features and an optimized classification process has been proposed in [C9], published in the 2015 IEEE proceedings of the Winter Conference on Applications of Computer Vision Workshops.

1.2 Document Image Analysis

My research group has focused on developing novel techniques suitable for digitally-born, graphics-intensive documents. Such techniques are in high demand, due to the fact that most information used for work-related purposes is now conveyed digitally, using complex mixtures of graphical elements and text. To classify content of business document images [J4], we have proposed a novel texture descriptor that exploits the sparseness of filter bank responses to various document textures. Our method was published in 2014 in the Springer International Journal on Document Analysis and Recognition (IJ DAR), the main journal in Document Image Analysis.

We continued our work on texture analysis by addressing the more general problem of robust texture segmentation and proposed novel descriptors based on sparseness measures [J3] and on local binary patterns [J3, C4, C15]. These more theoretical contributions were published in venues of broad interest for the computer vision and image processing community, namely the 2014 IEEE International Conference on Pattern Recognition, the 2016 Canadian Conference on Computer and Robot Vision, and the IEEE Journal of Signal Processing Letters. We have also focused on specific applications of interest to the Digital Image Analysis community, such as document layout segmentation using oblique cuts [C7] (published in the proceedings of the 2012 SPIE Conference on Document Recognition and Retrieval), and for change detection in graphics intensive documents [C21] (published in the proceedings of the 2015 ACM Symposium on Document Engineering).

Due to the complex format and content of graphics-intensive digital documents, simple ground truth models are not suitable for validation purposes. For this reason, we have recently proposed a layered ground truth model that integrates structural and statistical information [C1] (accepted at the 2016 IEEE International Conference on Pattern Recognition).

1.3 Medical Image Analysis

I have developed a variety of measurement and visualization techniques for supporting healthcare professionals in image-based diagnostic and therapy planning processes. This research is driven by stringent needs in the Canadian health care sector.

We proposed in [J9] a new morphology-based approach for inter-slice interpolation of CT and MRI datasets composed of parallel slices. Our method was published in a high-impact journal (IEEE Trans. on Biomedical Engineering) and has been cited 15 times since 2008. Our main contribution lies in successfully handling pairs of input slices with different topologies. Our interpolation algorithm is relevant for 3D morphometry and therapy planning, where the preservation of local shape details is a critical requirement.

Collaborative work with physiotherapists resulted in a novel tracking method adapted to low-resolution pelvic ultrasound [C25]. Work performed in collaboration with the BC Cancer Agency Victoria deals with the automatic detection of fiducial markers from low-

voltage, noisy electronic portal images used for patient alignment prior to prostate cancer external radiotherapy [C26]. The two methods above were published in the proceedings of the primary conference of the IEEE Engineering in Medicine and Biology Society (EMBS).

1.4 Video Surveillance

View-invariant gait modeling

A key issue in visual gait analysis is the varying angle between the optical axis of the camera and the direction of the walking trajectory. There is little research dedicated to this issue, since most often the gait is assumed to follow a linear trajectory viewed from a fronto-parallel viewpoint. In [J10, J11] we proposed two different methods for computing body part trajectories that are invariant to the walking direction and to the viewpoint. After normalization, the trajectories appear as if seen from a fronto-parallel viewpoint, which is optimal for gait modeling purposes. The methods mentioned above were published in high impact journals (Image and Vision Computing, and Pattern Recognition, respectively) and received 82 citations to date.

Abnormal event detection from uncontrolled video data

We address the problem of automatic fire detection and abnormal behavior analysis in the context of the 2011 Vancouver riot following the Stanley Cup final [C5, C8]. Video footage provided by citizens to the Vancouver police amounted to 1600 hours, which made human investigation of this rich data set impossible. Therefore, our papers (published in the proceedings of the 2015 and 2016 IEEE Canadian conference on Computer and Robot Vision) addressed a ‘computer vision in the wild’ problem, with a high societal impact.

2.2 Publications

Legend: Names in **bold** face are students that I have supervised or co-supervised for the work presented in the publication.

Refereed Book Chapter

[B1] **Prinz, R.**, A. Branzan Albu, and N. Livingston, "Quantification of gait improvement with a computer vision-based approach", chapter in IOS Press Book "Technology and Aging", January 2008, 264 pp., hardcover, ISBN: 978-1-58603-815-1.

Refereed Journal Publications

[J1] **A. Agahchen** and A. Branzan-Albu, "Chromatic Modulation in Visual Art: a Computational Perspective," submitted to the SPIE Journal of Electronic Imaging, July 2016.

[J2] **M. Cote** and A. Branzan Albu, "Teaching Socio-Cultural Impacts of Technology in Advanced Technical Courses: A Case Study," submitted to European Journal of

Engineering Education, June 2016.

[J3] **M. Cote** and A. Branzan Albu, "Robust Texture Classification by Aggregating Pixel-Based LBP Statistics." *IEEE Signal Processing Letters*. vol. 22, no. 911, pp. 2102-2106, 2015.

[J4] **M. Cote** and A. Branzan Albu, "Texture sparseness for pixel classification of business document images," *International Journal of Document Image Analysis*, vol. 17, pp. 257-273, 2014.

[J5] **N.T. Nguyen**, D. Laurendeau, and A. Branzan-Albu, "A robust method for camera motion estimation in movies based on optical flow", *Int. J. Intelligent Systems Technologies and Applications*, vol. 9, Nos. 3/4, pp.228–238, 2010.

[J6] **F. Jean**, R. Bergevin and A. Branzan Albu, "Computing and Evaluating View-Normalized body part trajectories," *Image and Vision Computing, Elsevier Science*, vol. 27, no 9, pp. 1272–1284, 2009.

[J7] **F. Jean**, A. Branzan Albu, and R. Bergevin, "Towards View-Invariant Gait Modelling: Computing View-Normalized Body Part Trajectories," *Pattern Recognition, Elsevier Science*, vol. 42, no 11, pp. 2936-2949, Nov. 2009.

[J8] **F. Jean**, and A. Branzan Albu, "The Visual Keyboard: Real-time feet tracking for the control of Meta-Instruments", *Signal Processing: Image Communication (Elsevier), Special issue on Semantic Analysis for Interactive Multimedia Services*, vol. 23, issue 7, pp. 505-515, 2008.

[J9] A. Branzan Albu, **T. Beugeling**, and D. Laurendeau, "A morphology-based approach for inter-slice interpolation of anatomical structures from volumetric images", *IEEE Transactions of Biomedical Imaging*, vol. 55, issue 8, pp. 2022-2038, 2008.

[J10] A. Branzan Albu, and **T. Beugeling**, "A three-dimensional spatiotemporal template for interactive human motion analysis", *Journal of Multimedia*, Academy Publishers, vol. 2, issue 4, pp. 45-54, 2007.

[J11] A. Branzan Albu, R. Bergevin, and **S. Quirion**, "Generic temporal segmentation of cyclic human motion", *Pattern Recognition, Elsevier Science*, vol. 41, pp. 6-21, 2008.

[J12] A. Branzan Albu, **M. Yazdi**, and R. Bergevin, "Detection of cyclic human activities based on the morphological analysis of the inter-frame similarity matrix", *Real-Time Imaging Journal, Elsevier Science, Special Issue on Video Object Processing*, Vol.11, pp. 219-232, June 2005.

Refereed Conference Publications

[C1] **M. Cote** and A. Branzan-Albu, "Layered Ground Truth: Conveying Structural and

Statistical Information for Document Image Analysis and Evaluation,” accepted to the *IEEE Int. Conf. on Pattern Recognition (ICPR 2016)*, Cancun, Mexico, Dec. 2016.

[C2] **M. Cote, A. Dash** and A. Branzan-Albu, “Look Who is NOT Talking: Assessing Engagement Levels in Panel Conversations,” accepted to the *IEEE Int. Conf. on Pattern Recognition (ICPR 2016)*, Cancun, Mexico, Dec. 2016.

[C3] **T. Sadhu**, A. Branzan-Albu, M. Hoeberechts, E. Wisernig, B. Wyvill, “Obstacle Detection for Image- Guided Surface Water Navigation,” *IEEE Proc. of the Canadian Conference on Computer and Robot Vision (CRV 2016)*, Victoria, BC, Canada, June 2016.

[C4] **M. Cote** and A. Branzan-Albu , “A Comparative Study of Sparseness Measures for Segmenting Textures,” *IEEE Proc. of the Canadian Conference on Computer and Robot Vision (CRV 2016)*, Victoria, BC, Canada, June 2016.

[C5] **K. Moria**, A. Branzan Albu, and K. Wu, “Computer Vision-Based Detection of Violent Individual Actions Witnessed by Crowds,” *IEEE Proc. of the Canadian Conference on Computer and Robot Vision (CRV 2016)*, Victoria, BC, Canada, June 2016.

[C6] **A. Dash, M. Cote**, and A. Branzan-Albu, “Automatic Speaker Identification from Interpersonal Synchrony of Body Motion Behavioral Patterns in Multi-Person Videos,” *ACM Proceedings of Workshop on Interpersonal Synchrony (INTERPERSONAL)* in conjunction with the *17th Int. ACM Conf. on Multimodal Interaction (ICMI 2015)*, Seattle, United States, Nov. 2015.

[C7] **J. Svendsen** and A. Branzan-Albu, “Change Classification in Graphics-Intensive Digital Documents,” *Proceedings of. ACM Symposium on Document Engineering (DocEng 2015)*, Lausanne, Switzerland, Sept. 2015.

[C8] **K. Moria**, A. Branzan Albu, and K. Wu, “Fire Detection in Videos of Violent Crowds Acquired with Handheld Devices,” *IEEE Proc. of the Canadian Conference on Computer and Robot Vision (CRV 2015)*, Halifax, NS, Canada, June 2015.

[C9] **N. Wang**, S. Cullis-Suzuki, and A. Branzan-Albu, “Automated Analysis of Wild Fish Behaviour in a Natural Habitat,” *Proceedings of the 2nd ACM Int. Workshop on Environmental Multimedia Retrieval (EMR 2015)*, in conjunction with the *ACM Int. Conf. on Multimedia Retrieval (ICMR 2015)*, Shanghai, China, June 2015.

[C10] **F. Jean**, A. Branzan Albu, D. Capson, et al , “Visualizing Category-Specific Changes in Oblique Photographs of Mountain Landscapes,” *ACM Proc. of Eurographics Workshop on Visualization in Environmental Sciences, (Envirvis)* , Cagliari, Italy, May 2015.

[C11] **F. Jean**, A. Branzan Albu, D. Capson, et al, “The Mountain Habitats Segmentation

and Change Detection Dataset”, *Proc. of the IEEE Winter Conference on Applications of Computer Vision (WACV)*, Kona, Hawaii, US, Jan 2015.

[C12] **A. Mendes**, M. Hoeberechts, and A. Branzan-Albu, “Evolutionary computational methods for optimizing the classification of sea stars in underwater images”, *Proc. of the IEEE Workshops with the Winter Conference on Applications of Computer Vision (WACV)*, Kona, Hawaii, US, Jan 2015.

[C13] **R. Fier**, A. Branzan-Albu, and M. Hoeberechts, “Automatic fish counting system for noisy deep-sea videos”, *Proc. of IEEE Oceans 2014*, St. John’s, Newfoundland, Canada, Sept 2014.

[C14] **M. Mehrnejad**, A. Branzan-Albu, M. Hoeberechts, and D. Capson, “Towards Robust Identification of Slow Moving Animals in Deep-Sea Imagery by Integrating Shape and Appearance Cues”, *ICPR Workshop on Computer Vision for Analysis of Underwater Imagery (CVAUI 2014)*, Stockholm, Sweden, August 2014.

[C15] **M. Cote** and A. Branzan Albu, “Sparseness-based descriptors for texture segmentation”, *Proc. of International Conference on Pattern Recognition (ICPR 2014)*, Sweden, August 2014.

[C16] **T. Beugeling** and A Branzan-Albu, "Computer Vision-Based Identification of Individual Turtles using Characteristic Patterns of Their Plastrons", *Proc. of the Canadian Conference on Computer and Robot Vision (CRV 2014)*, Montreal, May 2014.

[C17] **A. Agahchen** and A. Branzan-Albu, “Towards Understanding Beautiful Things: A Computational Approach for the Study of Color Modulation in Visual Art”, *Proc. of Eurographics 2014*, Strasbourg, France, April 2014.

[C18] **T. Beugeling** and A Branzan-Albu, "Sway Detection in Human Daily Actions Using Hidden Markov Models", *Proc. of the Engineering in Medicine and Biology Society (EMBS) Conference on Neural Engineering (NER 2013)*, San Diego, US.

[C19] **T. Beugeling** and A Branzan-Albu, "Detection of Objects and Their Shadows from Acoustic Images of the Sea Floor", *Proc. of IEEE Oceans 2013*, San Diego, US.

[C20] **M. Mehrnejad**, A. Branzan-Albu, M. Hoeberechts, and D. Capson, "Detection of Stationary Animals in Deep-Sea Video", *Proc. of IEEE Oceans 2013*, San Diego, US.

[C21] **J. Svendsen** and A. Branzan-Albu, "Segmenting Graphics-Intensive Business Documents", *Proc. of SPIE Electronic Imaging Conference, Document Recognition and Retrieval (DRR 2013)*, San Francisco, US.

[C22] **A. Gebali**, A. Branzan-Albu, and M. Hoeberechts, "Detection of Salient Events in Large Datasets of Underwater Video", *Proc. of IEEE Oceans 2012*, Virginia Beach, US.

- [C23] **T. Beugeling**, A. Branzan-Albu, M. Hoeberechts, and S. Mihaly, "3D Visualization of Circulation and Water Properties at the Endeavour Segment of the Juan de Fuca Mid-Ocean Ridge", *Proc. of IEEE Oceans 2012*, Virginia Beach, US.
- [C24] **J. Svendsen**, **T. Beugeling**, and A. Branzan-Albu, "Computer Vision-Based Assessment of Hand-Eye Coordination in Young Gamers: A Baseline Approach", *Proc. of Computer Vision and Pattern Recognition Workshops (CVPRW 2012) IEEE Conference on Computer Vision Pattern Recognition (CVPR 2012)*, Rhode Island, US.
- [C25] **F. Jean**, A. Branzan Albu, and C. Dumoulin, "Feature-based tracking of urethral motion in low-resolution trans-perineal ultrasound", *Proc. Int. Conf. of the IEEE Eng. in Medicine and Biology Society (EMBC 2011)*, Boston, US.
- [C26] **P. Bonneau**, A. Branzan Albu, and M. Hiltz, "Local Image Enhancement for Fiducial Marker Detection in Electronic Portal Images", *Proc. Int. Conf. of the IEEE Eng. in Medicine and Biology Society (EMBC 2010)*, Buenos Aires, Argentina.
- [C27] **K. Malakuti** and A. Branzan Albu, "Towards an Intelligent Bed Sensor: Non-Intrusive Monitoring of Sleep Irregularities with Computer Vision Techniques", *Proc. IEEE Int. Conf. on Pattern Recognition (ICPR 2010)*, Istanbul, Turkey.
- [C28] **F. Jean**, R. Bergevin, and A. Branzan Albu, "Trajectories Normalization for Viewpoint Invariant Gait Recognition", in *Proc. of IEEE Int. Conf. on Pattern Recognition (ICPR'08)*, Tampa, US.
- [C29] **G. Rivet-Sabourin**, A. Branzan Albu, L. Beaulieu, and D. Laurendeau, "Automatic contour retrieval in annotated TRUS prostate images", In *Proc. of the 5th IEEE Int. Symposium on Biomedical Imaging (ISBI'08)*, Paris, France.
- [C30] A. Branzan Albu, **B. Widsten**, **T. Wang**, **J. Lan**, and **J. Mah**, "A computer vision-based system for real-time detection of sleep in fatigued drivers", in *Proc. of the 5th IEEE Intelligent Vehicles Symposium (IV 2008)*, Eindhoven, Netherlands.
- [C31] **F. Jean**, A. Branzan Albu, A. Schloss, and P. Driessen, "Computer vision-based interface for the control of musical meta-instruments", *12th Conference on Human Computer Interaction (HCII International 2007)*, Beijing, China, pp. 428-432.
- [C32] A. Branzan Albu, N. Virji-Babul, **D. Kerr**, and R. Hovorka, "Funland: a playful software for the on-line assessment of facial emotion recognition skills in children", *12th Conference on Human Computer Interaction (HCII International 2007)*, Beijing, China, pp. 1189-1193.
- [C33] **N. T. Nguyen**, D. Laurendeau, and A. Branzan Albu, "A new segmentation method for MRI images of the shoulder joint", in *Proc. of the 4th IEEE Canadian Conference of Computer and Robot Vision (CRV 2007)*, Montreal, Canada, pp. 329-338.

[C34] **F. Jean**, R. Bergevin, and A. Branzan Albu, "Computing View-Normalized Body Part Trajectories", in *Proc. of the 4th IEEE Canadian Conference of Computer and Robot Vision (CRV 2007)*, Montreal, Canada, pp. 89-96.

[C35] A. Branzan Albu, **T. Beugeling**, N. Virji-Babul, and C. Beach, "Analysis of Irregularities in Human Actions with Volumetric Motion History Images", in *Proc. of IEEE Workshop on Motion and Video Computing (WMVC 2007)*, Austin, US, pp. 16-23.

[C36] A. Branzan Albu, "Vision-based user interfaces for health applications: a survey", in *Proc. of Advanced Visual Computing, 2nd International Symposium (ISVC 2006)*, Lake Tahoe, USA, pp. 771-782.

[C37] A. Branzan Albu, D. Laurendeau, et al. "MONNET: Monitoring pedestrians with a network of loosely-coupled cameras", in *Proc. IEEE Int. Conference on Pattern Recognition (ICPR 2006)*, Hong Kong, China.

[C38] **F. Jean**, R. Bergevin, and A. Branzan Albu, "Body tracking in human walk from monocular video sequences", in *Proc. of 2nd IEEE Canadian Conference on Computer and Robot Vision (CRV 2005)*, Victoria, Canada.

[C39] **S. Quirion**, A. Branzan Albu, and R. Bergevin, "Skeleton-based temporal segmentation of human activities from video sequences", in *Proc. of 13th Int. Conf. in Central Europe on Comp. Graphics, Visualization and Comp. Vision (WSCG 2005)*, Plzen-Broy, Czech Republic.

[C40] A. Branzan Albu, D. Laurendeau, **M. Gurtner**, and **C. Martel**, "A web-based remote collaborative system for visualization and assessment of semi-automatic diagnosis of liver cancer from CT Images", in *Proc. of 13th Medicine Meets Virtual Reality Conference (MMVR13-2005)*, Long Beach, US.

[C41] **M. Yazdi**, A. Branzan Albu, and R. Bergevin, "Morphological analysis of spatio-temporal patterns for the segmentation of cyclic human activities", in *Proc. IEEE Int. Conference on Pattern Recognition (ICPR2004)*, Cambridge, UK.

[C42] A. Branzan Albu, D. Laurendeau, C. Moisan, and D. Rancourt, "SKALPEL-ICT: Simulation kernel applied to the planning and evaluation of image-guided cryotherapy", in *Proc. Medical Robotics, Navigation and Visualization (MRNV 2004)*, Remagen, Germany.

[C43] **M.E. Tremblay**, A. Branzan Albu, D. Laurendeau, and L. Hébert, "Integrating region and edge information for the automatic segmentation for interventional magnetic resonance images of the shoulder complex", in *Proc. 1st IEEE Canadian Conf. on Computer and Robot Vision (CRV2004)*, London, Ontario, pp. 279-286.

[C44] A. Branzan Albu, D. Laurendeau, L. Hébert, H. Moffet, M. Dufour. and C. Moisan, "Image-guided analysis of shoulder pathologies: Modeling the 3D deformation

of the subacromial space during arm flexion and abduction", in *Proc. Int. Symp. on Medical Simulation (ISMS 2004)* (S. Cotin, D. Metaxas Eds.), Lecture Notes in Computer Science, Cambridge, US, pp. 193-202.

[C45] Branzan Albu, A., D. Laurendeau, L. Hébert, H. Moffet, and C. Moisan, "Three-dimensional reconstruction of the bony structures involved in the articular complex of the human shoulder using shape-based interpolation and contour-based extrapolation", in *Proc. 4th IEEE Int. Conf. on 3D Digital Imaging and Modeling (3DIM2003)*, Banff, Canada, pp. 370-377.

[C46] Branzan Albu, A., J.-M. Schwartz, D. Laurendeau, and C. Moisan, "Integrating geometric and biomechanical models of a liver tumor for cryosurgery simulation", in *Proc. Int. Symp. on Surgery Simulation and Soft Tissue Modelling 2003* (N. Ayache, H. Delingette Eds.), Lecture Notes in Computer Science, Springer, Juan-Les-Pins, France, pp. 121-131.

[C47] Branzan Albu, A., D. Laurendeau, and C. Moisan, "Tumor detection in MR liver images by integrating edge and region information", in *Proc. Modelling & Simulation for Computer-aided Medicine and Surgery 2002*, INRIA Rocquencourt, France, ESSAIM Proceedings Vol.12, pp. 17-24.

2.3 Invited Talks

[P1] Tutorial on "State of the Art in Automated Analysis of Underwater Imagery" (with M. Hoeberechts), IEEE Oceans, Monterey, United States, Sept. 2016.

[P2] "Computer Vision for Environmental Monitoring, " Invited Talk, Canadian Conference for Computer and Robot Vision (CRV), Victoria, Canada, June 2016.

[P3] "Image Analysis for Environmental Monitoring (with M. Hoeberechts). Discover UVic (outreach activity for high school students and their parents), University of Victoria, Nov. 2015.

[P4] "Analyse d'images de documents numériques", Invited talk at Laboratoire de Vision et Systemes Numeriques, Université Laval (sponsored by Prof. D. Laurendeau), Quebec City, May 2014.

[P5] "Detection of Salient Events in Large Datasets of Underwater Video," Invited talk sponsored by the IEEE Victoria Oceans Chapter, Victoria, December 2012.

[P6] "Medical Imaging Research at UVic: an overview of recent results," Invited talk hosted by Prof. Viergever, University of Utrecht, Netherlands, April 2012.

[P7] "Artificial Intelligence: Friend or Foe?," Cafe Scientifique public presentation sponsored by the Center on Aging at UVic, Victoria, BC, Canada, January 2012.

[P8] "Towards Building Computers That See," Invited Talk (Outreach) at Mount Douglas

High School, Victoria, BC, Canada, October 2011.

[P8] “Exploring New Horizons for Computer Vision,” Invited Seminar hosted by Prof. J.K. Aggarwal, University of Texas at Austin, December 2010.

[P9] “Computer Vision Research at the University of Victoria,” Invited Seminar at SAP Vancouver, December 2009.

[P10] “New Horizons for Computer Vision,” Invited Talk at the School of Engineering Science, Simon Fraser University, (sponsored by Prof. Lesley Shannon), Vancouver, Nov. 2009.

[P11] “Successful Industrial Partnerships,” panel member, Creating Connections 2009, Maple Ridge, BC, September 2009, (sponsored by the NSERC Chair for Women in Science and Engineering for BC).

[P12] “Computer Vision-Based Human Motion Analysis with Applications to Health Care,” Invited seminar at the Dept. of Computer Science, University of Northern British Columbia, (sponsored by Prof. L. Chen), Prince George (BC), April 2008.

[P13] “Computer Vision: Towards Building Computers that See,” Invited Talk (Outreach) at the Brentwood College, UVic Speaker’s Bureau Series, Victoria, October 2008.

[P14] “Analyse de Mouvement Humain dans le Contexte des Applications Biomedicales, Invited seminar at the Laboratoire de Vision et Systemes Numeriques,” Universite Laval (sponsored by Prof. D. Laurendeau), Quebec City, September 2008.

[P15] “Computer Vision-Based Human Motion Analysis with Applications to Health Care,” Invited seminar at the Laboratory for Computational Intelligence, University of British Columbia (sponsored by Prof. E. A. Croft), Vancouver, July 2008.

[P16] Tutorial on “Motion Analysis and Video Understanding,” IEEE International Conference on Signals, Circuits, and Systems, ISSCS 2005, Iasi, Romania, July 2005.

2.4 Research Funding

The following shows research funding that I obtained as principal investigator.

Index	Type	Source	Awarded	End
G1	Operating	NSERC-Engage ²	2016	2016
G2	Operating	NSERC-Engage	2016	2016
G3	Operating	Triumph and NSERC-CRD ³	2015	2018

² http://www.nserc-crsng.gc.ca/Professors-Professeurs/RPP-PP/Engage-Engagement_eng.asp

³ http://www.nserc-crsng.gc.ca/Professors-Professeurs/RPP-PP/CRD-RDC_eng.asp

G4	Operating	NSERC-Engage	2014	2014
G5	Operating	Plurilock and NSERC-CRD	2013	2015
G6	Operating	INTEL	2011	2012
G7	Contract	Kongsberg Mesotech	2010	2013
G8	Operating	FLIR and MITACS ⁴	2009	2009
G9	Operating	SAP Canada and NSERC-CRD	2011	2014
G10	Operating	MITACS	2008	2008
G11	Equipment	CFI/BCKDF	2009	2010
G12	Operating	NSERC-DG ⁵	2008	2013
G13	Operating	NSERC-DG	2006	2008
G14	Operating	NSERC-DG	2003	2006
G15	Operating	NATEQ-New Researcher	2003	2005
G16	Operating	Start-up UVIC	2005	

Grant Descriptions

[G1] Computer Vision-Based Part Number Recognition for Optimized Off-Logging Processes, funded by NSERC Engage

[G2] Computer Vision-Based Evaluation of Prosthetic Heart Valves, funded by NSERC Engage

[G3] Automatic Image Analysis and Generation of Digital Residential Floor Plans, funded by Triumph Electrical Consulting Engineering Ltd and by NSERC CRD

[G4] Computer Vision-Based Analysis of Digital Architectural Floor Plans, funded by NSERC Engage

[G5] Cloud-Based Secure Virtual On-Line Exam Center (SeVOEC), funded by Plurilock Inc. and by NSERC CRD.

[G6] Computer Vision for Multi-Core Processing, funded by INTEL.

[G7] Automatic Quantitative Analysis and Generation of Mosaics from Sonars, funded by Kongsberg Mesotech.

[G8] Development of Computer Vision Algorithms for Pan-Tilt-Zoom Surveillance Cameras, funded by FLIR Inc. and MITACS Accelerate BC.

[G9] A Framework for High-Level Content-Based representation of Screen-Rendered Documents, funded by SAP Canada and NSERC CRD.

⁴ <https://www.mitacs.ca/en/programs/accelerate>

⁵ http://www.nserc-crsng.gc.ca/Professors-Professeurs/Grants-Subs/DGIGP-PSIGP_eng.asp

[G10] Development of an Intelligent Bed Sensor Based on Computer Vision Techniques, \$ 15,000, funded by Tactex Inc. and MITACS Accelerate BC Internship Program.

[G11] Canadian Foundation for Innovation (CFI) and BC Knowledge Development Fund (BCKDF) VISION: A research facility for Computer Vision.

[G12] A Computer Vision-Based Framework for Human Motion Analysis with Applications to Health Care, NSERC Discovery Grant.

[G13] Abnormal Gait Detection with Applications to Senior Health Care, NSERC Discovery Grant.

[G14] Real-time unusual event detection in human motion in a surveillance context, NSERC Discovery Grant.

[G15] Analyse morphologique 3D de l'épaule humaine basée sur la vision par ordinateur. NATEQ Nouveaux Chercheurs.

[G16] University of Victoria Start-up Grant.

3 TEACHING

3.1 Courses Taught

Course	Term	Level	University
CENG421/ELEC536: Computer Vision	2008-2016	Graduate/undergraduate 4 th year	UVic
ELEC 435: Medical Image Processing	2011, 2013- 2015	undergraduate 4 th year	UVic
ELEC310: Digital Signal Processing I	2008-2011 2015	undergraduate 3 rd year	UVic
ELEC590: Directed Studies	2006-2015	graduate	UVic
SENG310: Human Computer Interaction	2006- 2007, 2010	undergraduate 3 rd year	UVic
CENG 412: Human Factors in Engineering	2009	undergraduate 4 th year	UVic
SENG412: Ergonomics	2007	undergraduate 4 th year	UVic
ELEC669A: Selected Topics- Fundamentals of Computer Vision	2006	graduate	UVic
GIF66900: Analyse de mouvement en vision par ordinateur	2004, 2005	graduate	Laval
MAT19961: Calcul matriciel	2004	undergraduate 1st year	Laval
GIF66800/22717: Introduction a la réalité virtuelle	2005	Graduate/undergraduate 4 th year	Laval

3.2 Publications Related to Teaching

[T1] F. Jean, A. Gebali, T. Beugeling, and A. Branzan-Albu, "An Educational Visual Prototyping Environment for Real-Time Imaging" Proc of the IEEE Conf on Frontiers in Education, FIE 2012.

[T2] A. Branzan Albu, "Learning Artificial Intelligence Clip-by-Clip: Post Class Reflections on the First Online Norvig-Thrun-Stanford-Know Labs Artificial Intelligence Course", Proc of the IEEE Conf on Frontiers in Education, FIE 2012.

[T3] A. Branzan Albu, H. Tuokko, K. Malakuti, and K. Kowalski, "Interdisciplinary Project-based Learning in Ergonomics for Software Engineers: A Case Study", Proc. of Int. Conf. of Softw. Engr. Adv., ICSEA, Malta, pp. 295-300, 2008.

[T4] A. Branzan Albu and R. Siemens, "Teaching Human-Computer-Interaction with Shakespeare Sonnets: a case study in interdisciplinary project-based learning" In Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2009, EDMEDIA 2009, pp. 973-979, Honolulu 2009.

[T5] A. Branzan Albu and K. Malakuti, "Work in Progress – Problem-based learning in digital signal processing", Proc of the IEEE Conf on Frontiers in Education, FIE 2009.

[T6] A. Branzan Albu, "Work in Progress-Imageria: A visual computing festival for girls", Proc of the IEEE Conf on Frontiers in Education, FIE 2009.

3.3 Graduate student supervision

Summary of supervisory duties at graduate level

Ph.D.		M.A.Sc.		Postdocs/Research associates	
Current	Graduated	Current	Graduated	Current	Past
4	5	2	12	1	2

Graduate supervision (currently supervised students)

Name	Degree	Thesis/Project Title
Melissa Cote	Research associate	Computer vision-based analysis of digital floor plans
Trevor Beugeling	Ph.D.	Automatic species identification in underwater and terrestrial images
Maryam Alizadeh	Ph.D.	Computer vision-based evaluation of prosthetic heart valves
Amanda Dash	Ph.D.	Video summarization
Alireza Rezvanifar	Ph.D.	Symbol spotting on residential floor plans
Tanmana Sadhu	M.A.Sc.	Obstacle detection for image-guided surface navigation
Dany Cabrera	M.A.Sc.	Wall and room segmentation on residential floor plans

4 SERVICE AND LEADERSHIP

4.1 Service to the University of Victoria

Administrative positions and committees

- 2014-2016: elected member of the Senate of the University of Victoria
- 2013-2014: elected member of the search committee for the Vice-president Research (representative of the Faculty of Engineering) at the University of Victoria
- 2011-present: Graduate Advisor for Interdisciplinary Individual Graduate Programs at the University of Victoria
- 2010-2012: member of the university steering committee of the Academic Women Caucus (AWC) at the University of Victoria
- 2010-2012: elected member of the Faculty Advisory Committee (Promotion and Tenure) (representative of the ECE Department)
- 2009-2010: elected member of the search committee for the Vice-president Academic (representative of the Faculty of Engineering)
- 2007-present: Technical Program Chair for the IEEE Victoria section

4.2 Service to international academic and research communities

Event Administration

- 2016 – 2017: Co-organizer (with M. Hoeberechts) of the 2nd ICPR Workshop on Computer Vision for Analysis of Underwater Imagery (CVAUI), Cancun, Mexico, Dec. 4 2016.
- 2015: Publication Chair, IEEE Pacific Rim Conference on Communications, Computers and Signal Processing (PACRIM 2015), Conference, Victoria, BC, Aug. 2015.
- 2013 – 2014: Co-organizer (with M. Hoeberechts) of the 1st ICPR Workshop on Computer Vision for Analysis of Underwater Imagery (CVAUI), Workshop, Stockholm, Sweden, Aug. 2014.

Service to International Associations and Research Organizations

- 2014-2016: elected IAPR Secretary (member of the executive committee)
- 2009-2012: IAPR Newsletter Editor.
- 2014-ongoing: Committee Member, Ocean Observatory Council⁶, Ocean Networks Canada
- 2013-ongoing: Member of the NOAA Strategic Initiative on Automated Image Analysis⁷

Grant Proposal Reviewer

⁶ <http://www.oceannetworks.ca/about-us/organization/committees>

⁷ http://marineresearchpartners.com/nmfs_aiasi/Home.html

- 2005-2016: NSERC Discovery Grants
- 2009, 2011, 2015: NATEQ – international committee for team grants evaluation
- 2008: Post-Doctoral Fellowships (Michael Smith Foundation for Health Research)
- 2008: Alberta Ingenuity New Faculty Award program
- 2007: NSERC Idea to Innovation Program
- 2007: Social Sciences and Humanities Research Council (SSHRC)
- 2010: National Science Foundation Merit Review

Journal Reviewer

- Pattern Recognition
- IEEE Transactions on Biomedical Engineering
- Computer Vision Image Understanding
- EURASIP Journal on Signal Processing
- Artificial Intelligence in Medicine