

CURRICULUM VITAE¹

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¹ last updated November 2010

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 Research Interests

I am interested in the field of Computer Vision. From a practical standpoint, my contributions to this field involve raising and solving research questions that are closely linked to societal needs such as rehabilitation, aging-in-place, medical imaging, and art. The nature of the research problems that I have been working on contains a substantial theoretical content, thus my contributions serve also to advancing the state-of-the-art in theoretical aspects of computer vision.

Due to the interdisciplinary nature of the research problems under investigation, I have developed a number of academic and industrial collaborations. I am a Qualified Health Researcher affiliated with the Center on Aging at UVic. I have recently developed research partnerships with the BC Cancer Agency, and with the Institut de recherche en Geriatrie at Universite de Montreal. My adjunct appointments with the Department of Computer Science at UVic, and with the Department of Electrical and Computer Engineering at Laval University enable me to actively collaborate with researchers with a variety of backgrounds, such as health informatics, computer vision, computer graphics, computer music, etc. The applied nature of my research has also led to industrial collaborations with companies such as SAP Business Objects, Vigil Health Inc., and ICX Technologies, who have provided funding for my research.

2.2 Most Significant Research Contributions

In disseminating the results of my research, I have carefully chosen the venues of my journal and conference papers in order to make sure that my research contributions reach the right audience. The computer vision community regards conference publications as extremely valuable. Top conferences use double-blind peer review processes and are very selective. For all my publications, the editorial boards (journals) and organizing/technical program committees (conferences) consist of top researchers of international caliber in Computer Vision, which made the peer-review processes very selective and competitive. Publications numbers refer to those in section 2.3 which include conference acceptance rate data.

Medical Image Analysis

My research addresses the development of interactive 2D and 3D data measurement and visualization techniques for supporting healthcare professionals in improving the processes of image-based diagnosis and therapy planning.

The most recent work presented in [C1] deals with the automatic detection of fiducial markers in prostate cancer radiotherapy. This work is done in collaboration with Dr. Hilts from BC Cancer Agency Victoria.

In [J5] we proposed a new morphology-based approach for inter-slice interpolation of CT and MRI datasets composed of parallel slices. The main contribution of our approach is its ability to interpolate between two anatomic shapes by creating a smooth, gradual

change of shape and without generating over-smoothed interpolated shapes. Creating interpolated shapes of similar smoothness with the input is relevant for various medical applications such as 3D morphometry and therapy planning, where the preservation of local shape details matters.

The work presented in [C18-20] deals with 3D modeling of anatomical structures (shoulder and liver) for simulating the motion of the shoulder and the deformation of liver tumours during cryo-probe insertion, respectively. This work has been done in collaboration with physiotherapists (Drs. Hebert, Moffet, Dufour, Moisan) and with my coworkers Drs. Laurendeau and Schwartz. My main contribution consisted in the geometrical modeling of the anatomical structures in the context of both interdisciplinary projects.

Building accurate 3D models of organs is possible only when the input data (i.e. the 2D contours located in parallel slices) is highly consistent with the anatomical reality. This is why I have investigated in [C4] the problem of contour retrieval from legacy data (i.e. manually annotated slices of prostate ultrasound). This work has been done as part of a PhD project, involving my previous PhD student, Dr. Rivet-Sabourin, and collaborators Drs. Laurendeau and Beaulieu.

A central issue in medical imaging concerns the integration of end-user requirements in the algorithmic design process. HCI design for medical applications is a difficult problem. In [C12], I have provided a survey of vision-based user interfaces for health applications, with an emphasis on the contribution of the embedded computer vision techniques to the usability and usefulness of user interfaces for medical interfaces.

Human Motion Analysis

Human motion modeling for interactive performance analysis

We proposed in [J6] a new approach for representing and visualizing human motion information. At the best of our knowledge, this is the first vision-based template designed for motion analysis purposes, rather than recognition or classification. Our approach translates motion abnormalities into geometric irregularities of a spatiotemporal surface, which are further analyzed using geometric descriptors. A significant feature of our motion model is its interactivity, which allows the user (physiotherapist) to focus on a particular instance of motion abnormality instead of getting global information about the subject's quality of motion.

Temporal segmentation of periodic activities from video data

Most of the recent studies in video-based human motion analysis are performed on video sequences containing a single activity. There is little research about video streams where the activity pattern changes over time. The work described in [J7, J8] addresses this issue by dealing with the temporal segmentation of multiple human actions from a continuous video sequence. This work is highly relevant for the computer vision-based interpretation of unconstrained human motions and actions, which is a key issue in the design of smart homes for aging-in-place.

Modelling human gait: tracking and trajectory normalization of body parts

In the context of human gait modeling, accurate tracking is an essential requirement. Thus, we have proposed new methods for tracking body parts in real-time in [C9], and

for normalizing spatiotemporal trajectories of the tracked feature points with respect to the viewpoint in [J2, J3].

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. This issue is typically not addressed in the literature about gait analysis, since most researchers assume a linear trajectory, captured from a fronto-parallel viewpoint. In [J2, J3] we propose two 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.

Perceptual Interfaces

We proposed in [J4] an algorithm for tracking feet motion and recognizing feet interactions with a ‘visual keyboard’. The ‘visual’ attribute comes from the fact that, unlike its physical counterpart, the keyboard prototype does not involve any force feedback during key-presses.

From a practical standpoint, the approach described in this paper is, at the best of our knowledge, the first approach using feet motion for interacting with a perceptual interface. Although the visual keyboard was originally designed in a computer music generation context, it can serve to other purposes as well. Applications of human computer interaction based on feet gestures may be found for example for display and mode control in non-contact operating rooms, while hands are busy with the surgical intervention.

2.3. 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] **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.

[J2] **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.

[J3] **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.

[J4] **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.

[J5] 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.

[J6] 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.

[J7] 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.

[J8] 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] **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.

[C2] **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, August 2010, pp. 4004-4007.

[C3] **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, Dec. 2008.

[C4] **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, May 2008.

[C5] 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, June 2008.

[C6] **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)*, Beijing, pp. 428-432, July 2007.

[C7] 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)*, Beijing, pp. 1189-1193, July 2007.

[C8] **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*, Montreal, pp. 329-338, May 2007.

[C9] **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*, Montreal, pp. 89-96, May 2007.

[C10] A. Branzan Albu, **S. Vadhan Mahajan**, P. Zeman, and J. Tanaka, "Spatiotemporal modelling of neural source activation from EEG data", in *Proc. of Canadian Conference on Electrical and Computer Engineering*, Vancouver, April 2007.

[C11] 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, TX, USA, pp. 16-23, Feb. 2007.

[C12] A. Branzan Albu, "Vision-based user interfaces for health applications: a survey", in *Proc. of Advanced Visual Computing, 2nd International Symposium*, Lake Tahoe, USA, pp. 771-782, Nov. 2006.

[C13] 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 (ICPR2004)*, Hong Kong, Vol.4, pp. 924-928, Aug. 2006.

[C14] **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, BC, pp. 144-151, May 2005.

[C15] **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, pp. 145-149, Feb. 2005.

[C16] 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)*, Long Beach, CA, US, pp. 75-78, Jan. 2005.

[C17] **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, Vol.4, pp. 240-243, Aug. 2004.

[C18] 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, pp. 285-302, March 2004.

[C19] **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, 2004.

[C20] 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, USA, Springer, pp. 193-202, 2004.

[C21] 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, Alberta, pp. 370-377, Oct. 2003.

[C22] 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*, (N. Ayache, H. Delingette Eds.), Lecture Notes in Computer Science, Springer, Juan-Les-Pins, France, pp. 121-131, June 2003.

[C23] 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*, INRIA Rocquencourt, France, ESSAIM Proceedings Vol.12, pp. 17-24, Nov. 2002.

Work Submitted for Publication

[S1] **J. Svendsen** and A. Branzan-Albu, "Computer Vision-Based Analysis of Patterns of Motor Behaviour in Subjects with Down Syndrome", submitted to the IEEE Int. Conf. on Face and Gesture Recognition, *FG 2011*.

[S2] **F. Jean**, R. Bergevin, and A. Branzan Albu, "Human Gait from One Camera", submitted to IEEE Int. Conf. on Computer Vision Pattern Recognition, *CVPR 2011*.

2.4 Invited Presentations and Talks

[P1] Exploring New Horizons for Computer Vision, *Invited Seminar at the University of Texas at Austin*, sponsored by Prof. J.K. Aggarwal, December 2010.

[P2] Computer Vision Research at the University of Victoria, *Invited Seminar at SAP Vancouver*, December 2009.

[P3] New Horizons for Computer Vision, *Invited Seminar at the School of Engineering Science, Simon Fraser University*, (sponsored by Prof. Lesley Shannon), Vancouver, November 2009.

[P4] 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).

[P5] 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.

[P6] Computer Vision: Towards Building Computers that See, *Invited Talk at the Brentwood College, UVic Speaker's Bureau Series*, Victoria, October 2008.

[P7] 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.

[P8] 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.

[P9] Motion Analysis and Video Understanding. *Tutorial, IEEE International Conference on Signals, Circuits, and Systems, ISSCS 2005*, Iasi, Romania, July 2005.

2.5 Research Funding

The following shows research funding in which I have been principal investigator.

Index	Type	Source	Awarded	End	Annual	Total
G1	Contract	Kongsberg Mesotech	2010	2013	23,000	92,000
G1	Operating	MITACS	2009	2009	30,000	30,000
G2	Operating	ARC-SAP	2009	2011	35,000	105,000
G3	Operating	MITACS	2008	2008	15,000	15,000
G4	Operating	Jade Bridges	2009	2009	3,000	3,000
G5	Equipment	CFI/BCKDF	2009	2010	236,750	236,750
G6	Operating	NSERC-DG	2008	2013	20,000	100,000
G7	Operating	Jade Bridges	2007	2007	6,000	6,000
G8	Operating	NSERC-DG	2006	2008	20,000	40,000
G9	Operating	NSERC-DG	2003	2006	30,000	120,000
G10	Operating	FQRNT	2003	2005	15,000	30,000
G11	Operating	Start-up UVIC	2005		40,000	40,000

TOTAL: \$ 499,000 Operating + \$ 236,750 Equipment

Descriptions

[G1] Collaborative Project with Kongsberg Mesotech Vancouver, Automatic Quantitative Analysis and Generation of Mosaics from Sonars, \$ 92,000 (2010)

[G1] Accelerate BC (MITACS) Internship, Development of Computer Vision Algorithms for Pan-Tilt-Zoom Surveillance Cameras, \$ 30,000 (2009)

[G2] ARC-SAP Fellowships, A Framework for High-Level Content-Based representation of Screen-Rendered Documents, \$105000 (\$ 35,000 per year, 2009-2012)

[G3] Accelerate BC (MITACS) Internship, Development of an Intelligent Bed Sensor Based on Computer Vision Techniques, \$ 15,000 (2008)

[G4] Jade-Bridges Grants, IMAGERIA 2.0, Design of an interactive image processing workshop for the K-12 curriculum, \$ 3,000 (2009)

[G5] Canadian Foundation for Innovation (CFI) and BC Knowledge Development Fund (BCKDF) VISION: A research facility for Computer Vision. \$ 236,000 (2009)

[G6] NSERC Discovery Grant, A Computer Vision-Based Framework for Human Motion Analysis with Applications to Health Care. \$ 120,000 (\$ 20,000 per year, 2008-2013)

[G7] Jade Bridges Program, A Fresh Vision for Smart Girls. \$ 6,000 (2007)

[G8] NSERC Discovery Grant, Abnormal Gait Detection with Applications to Senior Health Care. \$ 40,000 (\$ 20,000 per year, 2006-2008)

[G9] NSERC Discovery Grant, Real-time unusual event detection in human motion in a

surveillance context. \$ 90,720 (\$30,240 per year, 2003-2006)

[G10] NATEQ Nouveaux chercheurs, Analyse morphologique 3D de l'épaule humaine basée sur la vision par ordinateur. \$ 30,000 (15,000 per year, 2003-2005)

2.6 Industry Partnerships

-2009-2011 SAP Fellowship – see Research Funding, G2. This funding is used for paying the salary of a PhD student and for pursuing further research in automatic document analysis.

-2009: ICX Technologies, 360 Surveillance – see Research Funding, G1. Cash Contribution Towards MITACS: \$15,000. This funding is used for paying the salary of a M.A.Sc. student.

-2008: Vigil Health Inc. – see Research Funding, G3. Cash Contribution towards MITACS: \$ 7500. . This funding was used for paying the salary of a M.A.Sc. student.

-2007: Tactex Inc. – in-kind contribution of bed sensor (~\$ 500) for the study of sleep irregularities with computer vision techniques

3. TEACHING

3.1 Course Development

UVic (2005-2010)

- 2006-2008: *I have developed the new course CENG421/ELEC 536: Computer Vision*. This course has been first offered in this format in spring 2008 (based on ELEC669A, a special topics graduate course in computer vision that I offered in Spring 2006). My development efforts have consisted in selecting and creating the appropriate teaching materials (textbook, lecture slides, project themes, assignments). The course had a good enrolment at both undergraduate and graduate levels (8 graduate + 9 undergraduate students). Moreover, the student evaluations show that the course was perceived as a very positive and useful learning experience.
- Summer 2007: *I have completely redesigned CENG412: Human Factors in Engineering* (former SENG412: Ergonomics) in order to place a greater emphasis on engineering aspects and to enhance its design content. Since course notes from the previous course offerings reflected the viewpoint and teaching style of a psychologist rather than an engineer, I have rewritten all lecture notes (circa 500 new slides), assignments, exams, and project. Moreover, I have based the course upon a new textbook with a strong emphasis of engineering aspects of ergonomics.
- Spring 2008: *I introduced a new problem-based learning component in ELEC310 (Digital Signal Processing)*. This component consisted in a computer-based assignment requesting voice/image processing. This project was presented at the FIE 2009 (see section 3.4).

Laval (2003-2005):

- *I have designed and taught twice a new graduate course (GIF 66900: Analyse de mouvement en vision par ordinateur). This course represents an advanced computer vision course which covers aspects of dynamic scene understanding.*
- *In collaboration with Dr. Laurendeau, I have co-designed and co-taught GIF22717/66800: Introduction a la Realite Virtuelle*

3.2 Curriculum Development

As member of the biomedical engineering committee (nominated by the ECE Chair), I have contributed to the creation of a new biomedical option for the ELEC and CENG students. My individual responsibilities involved surveying the content of biomedical options/programs at other Canadian universities, as well as the creation of a new course (ELEC 435: Medical Image Processing). I was also responsible for the advertisement of this new option on the departmental home page.

3.3 Courses Taught

Course	Term	Level	University
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	crosslisted	Laval
ELEC669A: Selected Topics-Fundamentals of Computer Vision	2006	graduate	UVic
SENG310: Human Computer Interaction	2006, 2007, 2010	undergraduate 1 st year	UVic
ELEC499: Design Project	2006, 2007, 2008	undergraduate Capstone project	UVic
ELEC590: Directed Studies	2006, 2007, 2008, 2009	graduate	UVic
SENG412: Ergonomics	2007	undergraduate 4 th year	UVic
ELEC310: Digital Signal Processing I	2008, 2009, 2010	undergraduate 3 rd year	UVic
CENG421/ELEC536: Computer Vision	2008, 2009, 2010, 2011	cross-listed	UVic
CENG 412: Human Factors in Engineering	2009	undergraduate 4 th year	UVic

3.4 Publications Related to Teaching

I have conducted research on several aspects of Teaching and Learning, as follows:

- Efficiency of hybrid instructional styles (lecture-based and problem-solving) for large classes in core electrical and computer engineering courses (ELEC310). This research was supported by a Curriculum Development Grant (see 3.5). Research results were published in [T3].
- Teaching interdisciplinary skills in undergraduate engineering programs. This research was supported by two Curriculum Development Grants (see 3.5). Research results were published in [T1, T2].
- Teaching as advertising for engineering programs. Investigating new paths for recruiting female students into engineering programs. This research was supported by Jade Bridges (see 2.6). Research results were published in [T4].

[T1] Branzan Albu A., 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 (acceptance rate 30%).

[T2] Branzan Albu, A. and Siemens, R. “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 (acceptance rate 37%).

[T3] Branzan Albu, A. and K. Malakuti, “Work in Progress – Problem-based learning in digital signal processing”, Proc of the IEEE Conf on Frontiers in Education, FIE 2009, San Antonio (TX), Oct 2009 (acceptance rate 63%).

[T4] Branzan Albu, A., “Work in Progress – Imageria: A visual computing festival for girls”, Proc of the IEEE Conf on Frontiers in Education, FIE 2009, San Antonio (TX), Oct 2009. (acceptance rate 63%)

3.5 Funding Related to Teaching

All grants below are Internal Curriculum Development grants and were awarded by the Office of the NSERC Chair in Design Engineering at UVic.

- *Integration of a new design component into SENG412: Ergonomics* (4000 \$, awarded Jan. 2007)
- *SENG310 Interdisciplinary project analysis and report* (3000 \$, awarded Sept. 2007)
- *Enhancement of the design component of ELEC 310: Digital Signal Processing I* (2000 \$, awarded Dec. 2007)
- *Travel grant for oral presentation at the Canadian Conference of Design Engineering CDEN 2008* (1500 \$, awarded July 2008)

TOTAL: \$ 10,500

3.4 Graduate student supervision

Summary of supervisory duties at graduate level

Ph.D.		M.A.Sc.		Total
Active	Complete	Active	Complete	
4	1	6	8	19

Graduate supervision – Currently active students (9)

Name	Degree	Thesis Title	Start Date
Jeremy Svendsen	Ph.D.	Automatic analysis of screen-rendered documents	2009
Frederic Jean ²	Ph.D.	Modélisation et comparaison de la démarche de personnes à partir de séquences vidéo monoculaires	2005
Nguyen Nhat Tan ³	Ph.D.	Reconnaissance d'activités humaines à partir de séquences de films	2006
Joey Quevillon	M.A.Sc	Video surveillance with pan tilt zoom cameras	2007
Tony Christney ⁴	M.A.Sc	Automatic classification of seabed structures	2007
Patrick Bonneau ⁵	M.A.Sc	Automatic detection of fiducial markers for prostate cancer radiotherapy	2008
David Kerr	M.A.Sc.	Sketch-Based Image Retrieval in Large Databases	2009
Chris Gat ⁶	M.A.Sc.	Change Detection in Landscape Images	2009
Aleya Gebali	M.A.Sc.	TBA	2010
Trevor Beugeling	Ph.D.	Processing and Analysis of Underwater Acoustic Images	2010

Graduate supervision – Graduated students (9)

Name	Degree	Thesis Title	Graduation Year
Nguyen Nhat Tan ²	M.A.Sc.	Segmentation techniques for the detection of the bony structures in the human shoulder	2006
Sebastien Quirion ¹	M.A.Sc.	Detection automatique des activités cycliques dans le mouvement humain	2006
Louis Buteau Vaillancourt ²	M.A.Sc.	Paire stereo agile en vue d'une application a MONNET: etude du viewport	2006
Chris Dompierre ³	M.A.Sc.	AVATAR: une application de realite virtuelle	2006

² Co-supervised with Prof. Bergevin, Laval

³ Co-supervised with Prof. Laurendeau, Laval

⁴ Co-supervised with Prof. Chapman, School of Earth and Ocean Sciences, UVic

⁵ Co-supervised with Dr. Hiltz, BC Cancer Agency, Victoria

⁶ Co-Supervised with Dr. German, Computer Science, UVIC

Kedar Shrikande	M.A.Sc.	Analysis and visualization of conflicting requirements in software engineering	2007
Kaveh Malakuti	M.A.Sc.	Monitoring Sleep Irregularities with Computer Vision Techniques	2008
Jeremy Svendsen	M.A.Sc.	Analysis of Motor Skills in Subjects with Down's Syndrome using Computer Vision techniques	2009
Geoffroy Rivet Sabourin ²	PhD	Fusion de l'information clinique pour l'aide a la segmentation: application a la segmentation de la prostate pour la curietherapie	2009
Trevor Beugeling	M.A.Sc.	Analysis of abnormalities in daily human actions	2010

4 SERVICE AND LEADERSHIP

4.1 Service to the University of Victoria

Administrative positions and committees

- 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
- 2007: member of the ad-hoc committee for the design and implementation of a new biomedical engineering option for CENG and ELEC undergraduate programs
- 2006-2008: member of the ECE curriculum committee
- 2006: Faculty committee for Wighton Fund

Outreach activities

- 2009: participation at Creating Connections 2009, Maple Ridge (BC)
- 2009: development and organization of IMAGERIA 2.0 workshop (co-ed event for high-school students organized at the Brentwood College)
- 2008: invited talk (as member of UVIC speaker's bureau), Brentwood College. *Computer Vision: Towards Building Computers that see*
- 2007: development and organization of IMAGERIA workshop (visual computing festival for girls).
- 2007: participation at the Faculty of Engineering Open House event

4.2 Service to the academic community

Since January 2009, I am the elected Newsletter Editor for the International Association of Pattern Recognition (IAPR). This association has been founded in 1979 and counts more than 10000 members affiliated to their national IAPR sections. IAPR hosts a series

of top conferences in Computer Vision (such as the International conference on Pattern Recognition, ICPR, and the British Machine Vision Conference, BMVC).

Review of Tenure and Promotion Application

2008: Ecole Polytechnique de Montreal (Dept. de genie electrique et de genie informatique)

External Examiner (PhD Defense)

2008: University of Ottawa, “Towards Context-Aware Gesture Enabled User Interfaces” (supervisor: Prof. Georganas)

Grant Proposal Reviewer

- 2009: NATEQ – international committee for team grants evaluation
- 2008: Post-Doctoral Fellowships (Michael Smith Foundation for Health Research)
- 2008: Alberta Ingenuity New Faculty Award program
- 2005-2009: NSERC Discovery Grants
- 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

Conference Organization

- 2010: Co-Chair of Special Track on Visual Computing education for the International Symposium on Visual Computing (ISVC 2010)
- 2007: Local Arrangements Chair for IEEE PACRIM 2007

Program Committee Member

- 2010: ICPR workshop on Visual Animal and Insect Behaviour (VAIB 2010)
- 2010: IAPR International Conference on Signal and Image Processing (ICISP 2010)
- 2009: IEEE Asian Conference on Computer Vision (ACCV 2009)
- 2008: 5th Int. Conf. on Ubiquitous Computing (UIC08, Norway)

- 2008: IEEE Int. Conf. On Automation and Logistics 2008 (ICAL 2008, China)

4.3. Leadership experience and training

2005- ongoing:

Director of the Computer Vision Research Group at the University of Victoria

Administrative responsibilities:

- human resources:
 - supervising the research activity of 6 M.A.Sc. students and 1 PhD student (plus 2 PhD students co-supervised at Laval University)
 - conducting interviews and hiring of new graduate research assistants
 - organization of annual group retreats
 - organization of social events to promote team building
- finance:
 - management of a research budget of approx. 680,000 \$ (see Research Funding section)
 - management of 10 different research accounts
- public relations:
 - promoting the Computer Vision Research Group through invited talks (university-wide, community-wide, at national and international levels)
 - ensuring adequate presence at Greater Victoria industrial fairs
 - organizing on-campus and off-campus outreach activities for K-12 students

Leadership training

September 2008-ongoing

- registered in the Effective Workplace Relations Certificate (offered by the Human Resources Department at the University of Victoria to professional Employees and Faculty members)