

Curriculum vitae

Isabel Cyr

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Education and Diplomas

- Master's degree in Geomatics Sciences
Remote sensing
Centre for Research in Geomatics
Laval University, Québec City (Québec), 1999
www.crg.ulaval.ca

Thesis title:

Exploitation of SAR data from RADARSAT-1 for the cartography of underground water vulnerability

Thesis director:

Keith P.B. Thomson
Outgoing Scientific Director of Geomatics for
Informed Decisions Network (GEOIDE), Canada Network of Centre
of Excellence

Research training term (Porsgrunn, Telemark, January 1998):

Exploration of the Multivariate Image Analysis (MIA) to study
the using potential of RADARSAT-1 images in hydrogeology

Training professor:

Kim H. Esbensen
Professor in Chemometrics, University of Ålborg (AUE), Esbjerg,
DK
Head of the Chemometrics Group, Høgskolen i Telemark (HIT-
Technology Faculty), Porsgrunn, Telemark in 1998
Specialist of MIA technology
Associate Researcher at Centre for Research in Geomatics (Laval
University)
www.hit.no

Main courses:

Physics of Remote Sensing
Digital Vision
Radar and Micro-waves
Image Processing
Special subject: SAR image segmentation
Seminar: presentation of research results

- Bacalaureate in Geomatics
Engineering
Laval University, Québec city (Québec), 1996

Main courses:

Topometry
Computer assisted cartography

Geographic information system
 Photogrammetry
 Remote sensing
 Geodesy
 Geomatics technologies
 Legal landsurveying

- Bacalaureate in Civil Engineering
Hydraulics and Environment
 École Polytechnique of Montreal, Montréal (Québec),
 1992

Final-study project:

Influence of abrupt discharge variations at hydroelectric power stations Beauharnois-Les Cèdres and Carillon on St-Lawrence River water levels between Montréal and Trois-Rivières

Main courses:

Material Resistance
 Assisted Engineering Design
 Transportation engineering, Road design
 Geotechnics, Soil Mechanics, Geology
 Hydrology, Run-off, Hydraulics network design
 Waste Water Treatment, pumping stations and hydro power plants
 Structures, Metal construction, Concrete
 Thermodynamics

- Graduate and undergraduate courses
Northern studies, Geography Department &
Signal/Image Processing, Electrical Engineering Depart.
 Ottawa University, Ottawa (Ontario), 2005-2007
 - Cold regions Hydrology and Geomorphology
 - Northern Hydrology
 - Signal Analysis and Systems

Research grants

- Norwegian Embassy Travel Grant, 1997
- Teaching and Research Funds of Laval University Foundation, 1997

Professional memberships

- Québec Engineers Association (since 1993)
- Québec Remote Sensing Association (since 1998)

Work experiences and projects

- Geomatics Engineer
Topographic Information Center

Earth Sciences Sector, Geomatics Canada
Natural Resources Canada
 Ottawa, Ontario (May 2001-2008)

- Development, implementation and evaluation of new and improved automated methods and tools for detecting and extracting spatial and thematic changes in support of mapping and monitoring activities in Northern Canada (in areas of communities/buildings, economic interest, national parks, coastal areas) using multi-temporal areal photos and satellite imagery
- Development, implementation and optimisation (including user support and training) of rapid (semi-automatic) change detection and feature extraction methodologies and techniques for the determination of landscape changes and for the extraction of topographic features from multi-resolution, multi-sensor and multi-temporal satellite imagery using GIS tools
- Development, implementation and optimisation (including user support and training) of an interactive validation system of digital elevation models from topographic database
- Development, implementation and evaluation of a prototype for automatic generalization of the hydrological features in Northern Canada from 1:50K to 1:250K
- Development of methods and tools for producing image maps and detecting/extracting hydrographical features from SPOT-5 imagery

- Geomatics Engineer

Topographic Information Center

Geomatics Professional Development Program (GPDP)

Earth Sciences Sector, Geomatics Canada

Natural Resources Canada

Ottawa, Ontario (from May 1999 to April 2001)

- 1st assignment with Geodetic Surveys Division
Quality Assessment Method of Surface Meteorological Data at CACS (Canadian Active Control System) GPS Stations to Estimate Tropospheric Delay for Real-time Positioning

Outcome: Automated validation tool (daily displayed on intranet) of meteorological data at CACS stations

- 2nd assignment with Canada Center of Remote Sensing
Interactive Tool for Selecting Best Radarsat Images Stereo-pairs

Outcome: Interactive decision-making Web tool for selection of stereo images from RADARSAT in order to create digital elevation model (DEM) according to the application domain and the studying site conditions

http://ccrs.nrcan.gc.ca/resource/tutor/advisor/index_e.php

- 3rd and 4th assignments with Centre for Topographic Information
New Cartographic System - Rapid Revision by multi-resolution satellite imagery (see previous work experience)

- Ecology Research Assistant
Aquatic Ecology, Zoology Department
University of Toronto
Toronto, Ontario (February to April 1999)
 - *Analysis of temporal variations of water temperatures in different aquatic ecosystems in function of water body's size and fetch*

- Teacher in Computer Science
LaPocatière College
LaPocatière and Montmagny, Québec (October to December 1998)

- Research and Teaching Assistant in Remote Sensing
Geomatic Research Centre (CRG)
Laval University, Québec (1996-1998)
 - *Research on potential use of Radarsat images in hydrogeology*
 - *Comparison of 2 analysis methods: Hierarchical image segmentation and multivariate image analysis*
 - *Teacher Assistance for the course Introduction to Remote Sensing*

- Trainee in Geomatics
Legal Survey Division
Ministry of Natural Resources of Canada, Geomatics Canada
Whitehorse, Yukon (May to August 1995)
 - *Implementation of Yukon (Northern Canada) cadastral plans on GIS*

- Trainee in Geomatics
Roy, Côté, Perreault ass. (Land Surveyors)
Groupe Teknika
Sherbrooke, Québec (May to October 1994)
 - *Implementation and positioning of geodetic points (with GPS)*

- Teacher in Hydraulics
Sherbrooke College
Sherbrooke, Québec (September to November 1993)

- Municipal Inspection Assistant
Town of Deauville
Deauville, Québec (June to August 1991)
 - *Control and inspection of domestic septic installations*

- Trainee in Hydraulics Engineering
Groupe-conseil Enviraqua (Civil Engineers)
 St-Hyacinthe, Québec (May to August 1990)
 - *Rainstorm network and pumping station design*
- Survey and Civil Engineering Technician
Engineering Service
MRC de la Matapédia
 Amqui, Québec (June to August 1989)
 - Landsurveying, plans and estimates

Computer Skills

- Programmation languages
 VB/VBA for ArcGIS (ArcObject), Windows and Microsoft Office, C/C++, Java, PV-WAVE, IDL, HTML, PASCAL, FORTRAN, SQL, Unix scripts
- Image Processing Systems
 PCI/Geomatica, ERDAS/IMAGINE
- Image Segmentation and Analysis softwares
 E-Cognition (Feature extraction),
 WARD (Hierarchical Segmentation),
 MIA (Multivariate Image Analysis)
- Geographic Information Systems (GIS)
 ARCGIS, CARIS, MAPINFO
- Cartographic softwares
 MICROSTATION DESCARTES/MTA (Terrain Analysis), AUTOCAD
- Database Management Systems
 ORACLE, ACCESS, INFORMIX
- Statistical softwares
 SAS, Statistica
- Survey Software
 MICROSURVEY
- Numeric Video Restitution Software
 DVP
- Hydraulic Network Design softwares
 WATCAD, ILLUDAS
- Models
 DRASTIC (hydrogeology),
 ARCHIPEL (hydrology of the St-Lawrence River),
 1DMODEL (hydrodynamics of the St-Lawrence River)
- Computer Systems
 UNIX, WINDOWS

List of publications

- Cyr, I., Armenakis, A., Savopol, F. (2007) *Analytical Generalization Prototype GIS Tool for the Hydrological Network in Northern Canada*. Proceedings of the IPY GeoNorth 2007 Conference, 19-24 August, Yellowknife, North-West Territories, Canada, 11 p.
- Armenakis, C., F. Leduc, I. Cyr, F. Savopol and F. Cavayas (2003). A comparative analysis of scanned maps and imagery for mapping applications, *ISPRS Journal of Photogrammetry and Remote Sensing*, 57(5-6), 304-314.
- Cyr, H. and I. Cyr (2003). Temporal scaling of temperature variability from land to oceans, *Evolutionary Ecology Research*, 5(8), 1183-1197.
- Cyr I. and T. Toutin (2001). RADARSAT-1 Stereo Advisor on CCRS Web, *Canadian Journal of Remote Sensing*, 27(1), 62-66.
- Cyr, I. (1999). *Exploitation des données RSO de RADARSAT pour la cartographie de la vulnérabilité de la nappe souterraine*. Master thesis, Univ. Laval, 131 p.

Languages

Français, English, litt Norsk