

Curriculum Vitae

Professor Emeritus Gérard Lachapelle

OVERVIEW

Following an early career with Natural Resources Canada in the late 70s where he conducted and directed research related to geodesy, Professor Lachapelle moved to Calgary and became involved with the very first Canadian efforts related to the development and use of GNSS technologies. He was a founding member and the Executive VP of Nortech (Surveys) Canada Inc. and Norstar Instruments whose pioneering efforts in the development of GNSS technologies were a major part of Canada's continued success and strong international presence in the development, manufacturing and sale of GNSS products and services.

He has been involved in GNSS R&D since 1980, first in industry and as professor in the Department of Geomatics Engineering at the University of Calgary from 1988 onwards. He was department head from 1995 to 2003. He held a Canada Research Chair and an iCORE Chair in wireless location for 14 years starting in 2001. He and his colleagues created the Position, Location And Navigation (PLAN) Group, which developed numerous novel algorithms, processes, software and patents that have been licensed worldwide. In the 1980s and 90s, focus was on position and navigation algorithms and software development. In the 2000s and early part of the 2010s, research focused on signal processing in weak signal environments and on natural and electronic interference mitigation.

Professor Lachapelle formally retired in 2015 when he became professor emeritus. During his academic career, he has contributed to the training of hundreds of BSc students and over 130 thesis-based MSc and PhD students that are now active in the GNSS industry and academia worldwide. He is widely published and has received score of awards for his contributions. He has served in numerous professional and learned societies during his career. He holds degrees for Laval University, the University of Oxford, the University of Helsinki and the Technical University at Graz.

Professor Lachapelle received the Institute of Navigation Johannes Kepler Award in 1997 and is Fellow of IEEE, the Royal Society of Canada, the Institute of Navigation, the Royal Institute of Navigation, the International Association of Geodesy and the Canadian Academy of Engineering.

ACADEMIC AND PROFESSIONAL QUALIFICATIONS

- **Dr.techn.** (Science), Technical University at Graz, Austria, 1975
- **LPh**, University of Helsinki, Finland, 1973
- **MSc**, University of Oxford, United Kingdom, 1972
- **BSc**, Université Laval, Québec, Canada, 1971
- **PEng** (Professional Engineer) - Alberta, since 1983

AREAS OF SPECIALIZATION

- Global Navigation Satellite Systems (GNSS) and integrated navigation systems, geodesy, geomatics engineering

WORK EXPERIENCE

- Professor Emeritus and Faculty Professor, University of Calgary, since 2015.
- Professor, Department of Geomatics Engineering, University of Calgary, 1988 - 2015.
- Canada Research Chair/Informatics Centre of Research Excellence Chair (iCORE) in Wireless Location, 2001-2015.
- Head, Department of Geomatics Engineering, University of Calgary, 1995-2003.
- Executive Vice President, Norstar Instruments Ltd, 1985-1988.
- Executive Vice President, Advanced Technologies, Nortech Surveys (Inc.) Canada, 1983 – 1988.
- Head, Geodetic Research and Development, Sheltech Canada, a Division of Shell Canada Resources Ltd, 1980 – 1982.
- Researcher and Head, Research and Development Section, Geodetic Survey of Canada, Department of Energy, Mines, and Resources (Now Natural Resources Canada), Ottawa, 1975-80.

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS AND LEARNED SOCIETIES

- Institute of Navigation (U.S.) [Fellow] (Western Vice-President, 2002-03, Alberta Section Chair 1999-2009)
- Royal Institute of Navigation (U.K.) [Fellow]
- Royal Society of Canada [Fellow]
- Canadian Academy of Engineering [Fellow]
- Association of Professional Engineers, Geologists, and Geophysics of Alberta (APEGA)
- Canadian Institute of Geomatics [Life Member] (President, 1983-84)
- Institute of Electrical & Electronics Engineers, Inc (IEEE) [Fellow and Life Member] (TAES Associate Editor in Chief, 2000s)

DISTINCTIONS AND AWARDS (SINCE 1980)

- Schulich School of Engineering Distinguished Lifetime Leadership Award, 2017
- Yrjö Väisäsä Medal, Finnish Geospatial Institute, 2016
- Fellow, IEEE, 2015
- University of Calgary Killam Graduate Supervision and Mentoring Award, 2014
- Over 50 best paper awards and major awards received by graduate students at international conferences related to navigation during the last 25 years, including two Brad Parkinson awards (2006, 2010) for Best Doctoral Thesis in worldwide competitions organized by U.S. Institute of Navigation
- Burka Award, U.S. Institute of Navigation, 2012 [with past student & post-doctoral fellows]
- Schulich School of Engineering Mentorship Excellence Award, 2011
- 2010 Casey Baldwin Award, Canadian Aeronautics and Space Institute, together with colleagues and students from the University of Calgary and U.S. Navy
- Calgary Herald Compelling Citizen of the Year, 2009
- Schulich School of Engineering departmental graduate education award, 2009
- Weems Award, U.S. Institute of Navigation, 2009, for pioneering efforts related to Canada's successful GPS research and commercial involvement during the past 30 years and exceptional work in the area of education and R&D training of post-graduate students who are now playing important roles in the GPS industry and academia in Canada and the United States
- The Alberta Ingenuity Fund Research Excellence Award, APEGGA, 2007
- Fellow, Royal Institute of Navigation, U.K., 2006
- Michael Richey Medal (with past student and colleague), Royal Institute of Navigation, 2006
- Alberta Centennial Medal, 2005
- 2005 Schulich School of Engineering Graduate Education Award, University of Calgary
- 2005 Casey Baldwin Award, Canadian Aeronautics and Space Institute, together with colleagues from the University of Calgary and Spirent Communications (SW) Limited, U.K.
- 2004 Outstanding Leadership in Alberta Technology, Alberta Science and Technology (ASTech) Leadership Foundation
- 2004 Research Excellence Award, Faculty of Engineering, University of Calgary
- 2004 Research Excellence Award in Geomatics Engineering, Faculty of Engineering, University of Calgary
- Honorary Professor, Università Degli Studi Di Napoli Parthenope, Italy, 2003
- Fellow, The Institute of Navigation, U.S.A., 2003
- Fellow, Canadian Academy of Engineering, 2003
- Honorary Professor, University of Wuhan, China, 2002
- Fellow, Royal Society of Canada, 2002
- Canada Research Chair (2001-present) and iCORE Chair (2001-present) in Wireless Location
- Kuznetsov Medal, Kuznetsov Applied Mechanics Research Institute, Russia, for outstanding contribution to navigation, 2000
- APEGGA Frank Spragins Summit Award, for integrity, expertise and outstanding accomplishments in engineering, 2000

- Elected Full Member, Russian Academy of Navigation and Motion Control, 1999
- Honorary Professor, University of Electronic Science and Technology of China, 1999
- 1998 Research Excellence Award, Faculty of Engineering, University of Calgary
- 1998 Research Excellence Award in Geomatics Engineering, Faculty of Engineering, University of Calgary
- Alouette Award, Canadian Aeronautics and Space Institute, 1998, for outstanding achievement in space science and engineering
- Intermap Award, Canadian Institute of Geomatics, 1998, for best technical paper published in Geomatica in 1997
- Johannes Kepler Award, U.S. Institute of Navigation, 1997, for sustained and significant achievements to the field of satellite-based navigation (First non-U.S. resident to receive this coveted award)
- 1995 Research Excellence Award in Geomatics Engineering, Faculty of Engineering, University of Calgary
- Terra Award, Canadian Institute of Geomatics, 1994
- Fellow, International Association of Geodesy, 1991
- Best Lighthouse Technical Article Award, Canadian Hydrographic Association, 1991
- Best Lighthouse Technical Article Award, Canadian Hydrographic Association, 1990
- Prix Fonds Joncas, Ordre des Arpenteurs-Géomètres du Québec, 1989, for outstanding contribution to surveying engineering (Paper on Survey of CPR's Mount MacDonald Tunnel)
- Kenting Award, Canadian Institute of Surveying and Mapping, 1989
- Telefix Award, Canadian Institute of Surveying and Mapping, 1988
- Kenting Award, Canadian Institute of Surveying, 1985, for best technical paper published in The Canadian Surveyor
- Kenting Award, Canadian Institute of Surveying, 1980, for best technical paper published in The Canadian Surveyor

MAJOR SCIENTIFIC AND PROFESSIONAL SERVICE

- Member, Galileo Scientific Advisory Committee, European Space Agency, 2013-2020.
- Editorial Board, International Journal of Navigation and Observation, 2007-11.
- Editor (Navigation), *IEEE Transactions on Aerospace and Electronic Systems*, 2003-2009, and Associate Editor-in-Chief, 2006-2009
- Guest Editor, Special Issue on Annals of Telecommunications Special Issue on Positioning and Telecommunication systems Complementary aspects and benefits of merging the two, 2008-09
- Guest Editor, IEEE Journal of Selected Topics in Signal Processing (J-STSP) Special Issue on Advanced Signal Processing for GNSS and Robust Navigation, 2008-09
- Chair, Alberta Chapter, Institute of Navigation, 1999 - 2009
- Editorial Board, *GPS Solutions*, 1999-2009
- Editorial Board, *GPS World*, 1989-2010
- Western Vice-President, U.S. Institute of Navigation, 2002-03
- General Chair, GPS 2002, The Institute of Navigation, Portland, OR, 2002
- Convenor (with M.E. Cannon), KIS 2001 Conference, Banff, 2001

- Program Chair, GPS 2001, The Institute of Navigation, Salt Lake City, 2001
- Program Chair, World Congress, International Association of Institutes of Navigation, San Diego, 2000
- Technology Advisory Board, one Federal Government Agency (till 2006) and one major U.S.-based GPS equipment manufacturer, 2005-08
- Advisor, NRCan Stakeholder Geodetic Workshop on the Future, 1998
- Convenor (with M.E. Cannon), Third International Symposium on Kinematic Systems in Geodesy, Surveying and Remote Sensing, Banff, 1997
- Editorial Board, The Netherlands-based Geomatic Info Magazine (1995-96)
- Chair, ACLS Board of Examiners Committee, 1994-95
- Board of Directors, Association of Canada Lands Surveyors (ACLS), 1990-94
- Convenor (with M.E. Cannon), Second International Symposium on Kinematic Systems in Geodesy, Surveying and Remote Sensing, Banff, 1994
- President (1992-93), Past President (1993-94), Association of Canada Lands Surveyors
- Chair, International Union of Surveying and Mapping Workshop on GPS, FIG90 Congress, Helsinki, 1990
- Deputy Program Chair, IEEE PLANS'94, Las Vegas, April 1994
- Editorial Board, Canadian Aeronautics and Space Journal, 1989-94
- Editorial Advisory Board, SPN - Navigation, Germany, 1992-95
- Technical Chair, 1991 Annual Joint Meeting of Canadian Institute of Surveying and Mapping/Canadian Remote Sensing Society
- Co-chair, International Symposium on Kinematic Systems in Geodesy, Surveying and Remote Sensing, Banff, September 1990
- Chair, Workshop on Emerging Technologies in Future Navigation Systems in the Transportation Sector, CASI, Toronto, May 15, 1990
- Chair, 8th Canadian Navigation Symposium, CASI, Toronto, 1990
- Chair, Colloquium V on Petroleum Surveying in the 90s, Canadian Petroleum Association, Calgary, 1989
- Chair, Canadian Navigation Society, CASI, 1989-92
- Chair, Calgary Branch, Canadian Aeronautics and Space Institute, 1989
- Member of Advisory Committee on Cost/Benefit Analysis of Loran-C in Canada, Transport Canada, 1990
- Member of Advisory Committee on Canadian Radionavigation Plan - Land Part, Transport Canada, 1988
- Member of Board of Examiners for Canada Lands Surveyor, Department of Energy, Mines and Resources, Ottawa, 1982-2000
- Conference Chair, Colloquium IV of Canadian Petroleum Association/ Canadian Hydrographic Association, Lake Louise, 1986
- Member of NSERC Selection Grant Committee (Civil Engineering), 1987-90
- President, Special Study Group 1.105 on GPS Kinematic Methods and Applications, International Association of Geodesy, 1987-91
- President, Canadian Institute of Surveying, 1983-84
- Third Vice President, International Association of Geodesy, 1983-87
- Member of Canadian Institute of Surveying Task Force on the Surveying and Mapping Industry in Canada, 1983-84

- Member of Canadian Geoscience Council Review Committee of the Earth Physics Branch, Department of Energy, Mines and Resources, 1983-85
- Associate Editor, Journal of Geophysical Research, American Geophysical Union, 1984-85
- Associate Editor, EOS Transactions, American Geophysical Union, 1979-82
- Technical Chair, Surveying and Mapping Colloquium III, Canadian Petroleum Association, Banff, 1981
- Secretary, Section V, International Association of Geodesy, 1979-83
- Member of NRC Canadian National Committee for the International Union of Geodesy and Geophysics, 1979-83
- Conference Chair, Second International Symposium on Problems Related to the Redefinition of North American Vertical Geodetic Networks, Ottawa, 1980
- Chair of numerous CIS Technical and Professional Committees, 1975 - 1983
- Member of various scientific Special Study Groups of the International Association of Geodesy, 1973-1987

PATENTS AND LICENSES

(Underlined names are past or present graduate students/post-doctoral fellows)

- Vyasraj Guru Rao, Sashidharan Manikham and Gerard Lachapelle (2016) Navigation data structure generation and data transmission for optimal time to first fix, US Patent 9,405,009
- Jafarnia-Jahromi, A., S. Daneshmand, A. Broumandan, J. Nielsen and G. Lachapelle (2012) GNSS Anti-Interference Using Array Processing. Submitted to U.S. Bureau of Patents, November 2012. Publication No. US20140247186 (Sep 2014)
- Afzal, H., V. Renaudin, and G. Lachapelle (2012) System and Method for Gyroscope Error Estimation. U.S. Bureau of Patents, Publ No. US20120259572, October 2012.
- Nielsen, J., A. Broumandan and G. Lachapelle (2010) Method and System for Detecting GNSS Spoofing Signals. Patent No 7,952,519, U.S. Bureau of Patents.
- Nielsen, J., A. Broumandan and G. Lachapelle (2013) Signal Detection in Fading Environments. Patent No. 8,494,569, U.S. Bureau of Patents.
- Nielsen, J., A. Broumandan and G. Lachapelle (2012) Handheld Synthetic Antenna Array. Patent No 8,340,588, U.S. Bureau of Patents.
- Lachapelle, G., M. Petovello, C. O'Driscoll and D. Borio (2007) GSNRx™ (GNSS Software Navigation Receiver), licensed to industrial, academic and government organizations, 2008-13.
- Petovello, M, and G. Lachapelle (2010) Methods and Systems for Doppler Frequency Shift Removal and Correlation for Software-Based Receivers. Patent #7,679,551, U.S. Bureau of Patents.
- Julien, O., C. Macabiau, M. E.Cannon and G. Lachapelle (2011) BOC Signal Acquisition and Tracking Method and Apparatus. Patent No 7,916,771, U.S. Bureau of Patents.
- G. Lachapelle & students (2003) NDL (Navigation Development Library). Licensed by University Technologies International.
- M. Petovello, M.E. Cannon, and G. Lachapelle (2003-08) SAINT (Satellite and Inertial Technology), software for the integration of GPS and IMU data. Licensed by University Technologies International

- G. Lachapelle, M.E. Cannon (2000-04) MultiRef, software for multiple reference stations Real-Time Kinematic GPS application. Licensed by University Technologies International
- M. Fattouche, R. Klukas, A. Borsodi, M. Astridge, G. Lachapelle, and H. Zaghoul (1999). Super-Resolution Wireless Location System to Position Wireless Telephones and Radio Tags. U.S. Patent No. 5,890,068
- Cannon, M.E., G. Lachapelle and M. Petovello (1997) C³ NAVG² software for Precise Differential GPS/GLONASS Navigation. Licensed by University Technologies International
- M.E. Cannon, G. Lachapelle & students (1993-05) FLYKIN™ and FLYKIN+ software for cm level accuracy DGPS positioning. Licensed by University Technologies International
- G. Lachapelle & students (1993-07) HEAD™, HEADRT™ and HEADRT+ software for GPS-based attitude determination. Licensed by University Technologies International
- Cannon, M.E., and G. Lachapelle (1991-97) C³ NAV software for Precise Differential GPS Navigation. Licensed by University Technologies International.

MASTER AND PHD STUDENTS SUPERVISED AND CO-SUPERVISED TO COMPLETION

P. Gratton, MSc, 2021 (co-supervision)
 S. Tantry, Meng, 2019
¹A. Pirsiavash, PhD, 2018 (with co-supervision)
 S. Tantry, Meng, 2019
 A. Shafaati, PhD, 2017 (with co-supervision)
 Y. Li, PhD, 2017 (co-supervisor in ENEL)
 N. Vagle, PhD, 2016
 Lingran Li, MSc, 2016 (with co-supervision)
 N. Norman, MSc, 2016
 A. Clare, MSc, 2016 (with co-supervision)
 R. Siddakatte, PhD, 2016
 T. Marathe, PhD, 2016
 N. Fadaei, MSc, 2016 (with co-supervision)
 B. Aumayer, PhD, 2016 (co-supervision)
 A. Shettigar, MSc, 2015 (with co-supervision)
 V. Bellad, PhD, 2015 (co-supervision)
 G.S. Naveen, PhD, 2015 (co-supervision)
 S. Bhaskar, PhD, 2014 (co-supervision)
 T. Melgard, PhD, 2015 (with co-supervision)
²Negin Sokhandan, PhD, 2014
 Anup Dhital, PhD, 2014
 Y Li, MSc, 2014 (co-supervision in ENEL)
 N. Dewar, 2015, MSc (co-supervision in ENEL)
 S. Krasouski, MSc (co-supervision), 2015
 M. Mozaffari, MSc (co-supervision), 2014

¹ Best Student Paper Award, European Navigation Conference 2018, Gothenburg, Sweden, May 14-17

² Institute of Navigation Best Student Paper Sponsorship Award, 2013

Mazhar Lakhani, MSc, 2013 (co-supervision in ENEL)
 Laura Ruotsalainen, PhD, 2013 (co-supervision at Tampere University of Technology)
 Mohammad Abdizadeh, PhD, 2013
 Mahsa Shafiee, PhD, 2013
³A. Jafarnia, PhD, 2013
 Tao Lin, PhD, 2013
⁴Saeed Daneshmand, PhD, 2013
⁵Vyas Rao, PhD, 2013
 Zhe He, PhD, 2012
 Melania Susi, MSc, 2012
⁶Nima Sadrieh, PhD, 2012
 Tao Li, PhD, 2012
 Hatef Keshvadi, MSc, 2011
 Behnam Aminian, MSc, 2011
 Pratibha Anantharamu, PhD, 2011
^{7,8}Shashank Satyanarayana, PhD, 2011
 Mohamed Tamazin, MSc, 2011
⁹Ahmed Kamel, PhD, 2011
 Stephen Ching, MEng, 2011
¹⁰Haris Afzal, PhD, 2011
 Vahid Dehghanian, PhD, 2011 (co-supervision in ENEL)
¹¹Mohammadreza Zaheri, MSc, 2011
^{12,13}Jared Bancroft, PhD, 2010
 Anshu Pahadia, MSc, 2010
 Niamh O'Mahony, PhD, 2010 (co-supervision at National University Cork, Ireland)
 James Curran, PhD, 2010 (co-supervision at National University Cork, Ireland)
 Jakob Jakobsen, PhD, 2010 (co-supervision at University of Copenhagen, Denmark)
 Leslie Montloin, Master, 2010 (co-supervision at ENAC, Toulouse, France)
 Nicola Linty, Master, 2010 (co-supervision at Politecnico di Torino, Italy)
¹⁴Aiden Morrison, PhD, 2010
¹⁵Richard Ong, MSc, 2010
 Leïla Kleiner, Master, 2010 (co-supervision at EPFL, Lausanne, Switzerland)
¹⁶Pejman Kazemi, PhD, 2010
 Dina Salem, PhD, 2010
 Aleks Knezevic, MSc, 2010
¹⁷Kannan Muthuraman, PhD, 2010

³ *Third Prize, National Security Innovation Competition, (U.S.) National Homeland Defense Foundation, Colorado Spring, April 2012 [with PhD candidate Ali Jafarnia]*

⁴ *Third Prize, National Security Innovation Competition, (U.S.) National Homeland Defense Foundation, Colorado Spring, April 2012 [with PhD candidate Ali Jafarnia]*

⁵ *Several patents applied for in early 2013 based on his PhD thesis*

⁶ *Institute of Navigation Best Student Paper Sponsorship Award, 2011*

⁷ *Institute of Navigation Best Student Paper Sponsorship Award, 2010*

⁸ *Institute of Navigation Burka Award (with tow others), for Best Paper published in J. of Navigation in 2011*

⁹ *Institute of Navigation Best Student Paper Sponsorship Award, 2010*

¹⁰ *Patent based on PhD thesis pending*

¹¹ *IEEE/ION PLANS 2010 Track C Best Paper Award, 2010*

¹² *Institute of Navigation Best Student Paper Sponsorship Award*

¹³ *Casey Baldwin Award, Canadian Aeronautics and Space Journal*

¹⁴ *Institute of Navigation Best Student Paper Sponsorship Award*

¹⁵ *Chancellor David B. Smith Gold Medal in Engineering and the APEGGA Education Foundation Gold Medal in Engineering*

¹⁶ *Institute of Navigation Best Student Paper Sponsorship Award*

Lionel Garin, PhD, 2010
 Li Tao, MSc, 2009
 Nadia Sokolova, MSc, 2009
 Florence Macchi, PhD, 2009
^{18,19} Cyrille Gernot, PhD, 2009
^{20, 21,22,23} Ali Broumandan, PhD, 2009
 Salvatore Fazio, Master (co-supervision at Politecnico di Torino)
 Ashkan Izadpanah, MSc, 2009
 Anna Martinetti, Master, 2009 (co-supervision at Politecnico di Torino, Italy)
 Sid Kwakkel, MSc, 2008
 Nazila Salimi, MSc, 2008
 Cécile Mongrédien, PhD, 2008
 Alexander Ebner, Master (co-supervision at Technical University at Graz), 2008
 Upal Mahfuz, MSc, 2008
^{24, 25} Pascal Gaggero, Master (co-supervision at the University of Neuchâtel), 2008
 Daniele Borio, PhD (co-supervision at Politecnico di Torino), 2008
^{26,27} Surendran K Shanmugam, PhD, 2008
 Ahmad Reza Moghaddam, MSc, 2007
 Donghua Yao, MSc, 2007
 Shahin Charkhandeh, MSc, 2007
²⁸ Yu Wei, MSc, 2007
 Dingchen Lu, PhD (co-supervision in Dept of Electrical & Computer Eng, Univ. of Calgary), 2007
 Jianning Qiu, MSc, 2007
²⁹ Guojiang Gao, PhD, 2007
 Jalal, Al-Azizi, MEng, 2006
 J. Collin, PhD (co-supervision at Tampere University of Technology), 2006
³⁰ Minmin Lin, MSc, 2006
 Tao Hu, MSc, 2006
 N. Kim, MSc, 2006
 Min Wang, MEng, 2005
 Dhar Karunanayake, MSc, 2005
³¹ Heidi Kuusniemi (co-supervision at Tampere University of Technology), 2005
^{32,33} Olivier Julien, PhD, 2005
 Robert Watson, MSc, 2005
 Diep Dao, MSc, 2005
 Yong Ahn, MSc, 2005
³⁴ Oleg Mezentsev, PhD, 2005
 Ping Lian, MSc, 2004

¹⁷ GEOIDE Communicator of Excellence Award

¹⁸ Institute of Navigation Best Student Paper Sponsorship Award

¹⁹ European Navigation Conference Student Paper Competition Award, Toulouse, 2008

²⁰ Patents based on PhD thesis and PDF research issued and pending

²¹ Institute of Navigation Best Student Paper Sponsorship Award

²² Institute of Navigation Brad Parkinson Award for Best Thesis (Worldwide Competition) in the area of satellite-based navigation, 2010

²³ IEEE Southern Alberta Section Best Student Paper Award

²⁴ Institute of Navigation Best Student Paper Sponsorship Award

²⁵ Prix Omega and Prix Electrosuisse

²⁶ Institute of Navigation Best Student Paper Sponsorship Award

²⁷ European Navigation Conference Student Paper Competition Award, Geneva, 2007

²⁸ Institute of Navigation Best Student Paper Sponsorship Award

²⁹ Institute of Navigation Best Student Paper Sponsorship Award

³⁰ Institute of Navigation Best Student Paper Sponsorship Award

³¹ Institute of Navigation Best Student Paper Sponsorship Award

³² Institute of Navigation Best Student Paper Sponsorship Award

³³ Institute of Navigation Brad Parkinson Award for Best Thesis (Worldwide Competition) in the area of satellite-based navigation, 2006

³⁴ Institute of Navigation Best Student Paper Sponsorship Award

³⁵Paul Alves, PhD, 2004
³⁶W. Adbel-Hamid, PhD, 2004
 Z. Jiang, MSc, 2004
³⁷J. Angelo, MEng, 2004
^{38,39}C. Basnayake, PhD, 2004
⁴⁰K. O'Keefe, PhD, 2004
 L. Dong, MSc., 2003
⁴¹R. Stirling, MSc, 2003 (co-supervision at University of Alberta)
 M. Rajabi, PhD, 2003
 C. Wang, MSc, 2003
⁴²C. Ma, PhD, 2003
⁴³G. MacGougan, MSc, 2003
⁴⁴M. Petovello, PhD, 2003
⁴⁵G. Pugliano, PhD (co-supervision at Università Degli Studi Di Napoli "Parthenope), 2002
 Y. Lu, MEng, 2002
⁴⁶S. Ryan, PhD, 2002
 E. Fonseca, PhD (co-supervision at University of Sao Paulo), 2002
 G. Liu, MSc, 2001
 A. Jakab, MSc, 2001
 A. Wang, Master (co-supervision at Technical University of Norway), 2001
⁴⁷N. Luo, PhD, 2000
⁴⁸J. Stephen, MSc, 2000
⁴⁹J.H. Keong, MSc, 1999
⁵⁰J. Zhang, MSc, 1999
 J. Raquet, PhD, 1998
⁵¹Z. Zhang, MSc, 1997
^{52, 53}R. Klukas, PhD, 1997
 T. Morley, MSc, 1997
⁵⁴N. Hayashi, MSc, 1996
 J. Schleppe, MEng, 1996
 C. Tang, MSc, 1996
⁵⁵D. Chen, PhD, 1994
 W. Qiu, MSc, 1993
⁵⁶B. Townsend, MSc, 1993
 C. Liu, MSc, 1993
⁵⁷C. Erickson, MSc, 1992

³⁵ *Institute of Navigation Best Student Paper Sponsorship Award*
³⁶ *Institute of Navigation Best Student Paper Sponsorship Award*
³⁷ Corporate Winner Finalist in Commercial Systems, Rockwell Collins, 2011
³⁸ *Institute of Navigation Best Student Paper Sponsorship Award*
³⁹ *General Motors Charles L. McCuen Award, 2006, 2008, and 2007 OnStar President's Award, GM's Boss Kettering Award 2010*
⁴⁰ *Institute of Navigation Best Student Paper Sponsorship Award*
⁴¹ *Royal Institute of Navigation (RIN) Michael Richey Medal*
⁴² *Institute of Navigation Best Student Paper Sponsorship Award*
⁴³ *Institute of Navigation Best Student Paper Sponsorship Award*
⁴⁴ *Institute of Navigation Early Achievement Award, 2007, and APEGGA Early Achievement Award*
⁴⁵ *Institute of Navigation Best Student Paper Sponsorship Award*
⁴⁶ *Institute of Navigation Best Student Paper Sponsorship Award*
⁴⁷ *Institute of Navigation Best Student Paper Sponsorship Award*
⁴⁸ *Institute of Navigation Best Student Paper Sponsorship Award*
⁴⁹ *Institute of Navigation Best Student Paper Sponsorship Award*
⁵⁰ *Institute of Navigation Best Student Paper Sponsorship Award*
⁵¹ *Institute of Navigation Best Student Paper Sponsorship Award*
⁵² *Patent partly based on PhD thesis issued*
⁵³ *Institute of Navigation Best Student Paper Sponsorship Award*
⁵⁴ *Institute of Navigation Best Student Paper Sponsorship Award*
⁵⁵ *Institute of Navigation Best Student Paper Sponsorship Award*
⁵⁶ *Institute of Navigation Best Student Paper Sponsorship Award, 1992*

J. McLellan, MEng, 1992
⁵⁸G. Lu, MSc, 1991
K. Wong, MEng, 1991
J. Johnson, MEng, 1991
T. Speakman, MEng, 1990

POST-DOCTORAL FELLOWS (PDF) AND RESEARCH ENGINEERS SUPERVISED (SINCE 2000)

Dr. Ranjeeth Kumar, 2016-2017
⁵⁹Dr. Ali Broumandan, 2009-12, Oct 2013-2018
Dr. Thyagaraja Marathe, 2016-2017
Dr. Niranjana Vagle, 2017-2017
Dr. Saeed Daneshmand, 2013-2017
Dr. Tao Lin, 2013-15
^{60, 61}Dr. Ali Jafarnia, Sep 2013-2016
Dr. Negin Sokhandan, 2014-2015
Dr. Fatemeh Ghafoori, 2012-13
⁶²Dr. James Curran, 2011-2013 d
Dr. Vahid Deghanian, 2011-12
⁶³Dr. Jared Bancroft, 2011-12
Dr. Aiden Morrison, 2010-11
Dr. Valérie Renaudin, 2009-12
⁶⁴Dr. D. Borio, PDF, 2008-2010
Dr. T. Williams, PDF, 2008-2010
Dr. C. O'Driscoll, PDF, 2007-2010
Dr. M. Petovello, PDF, 2003-2007
R. Watson, MSc, research engineer, 2005-07
S. Godha, MSc, research engineer, 2005-07
¹Dr. W. Adbel-Hamid, PDF, 2005-08
J. Schleppe, MSc, senior research engineer, 2004-06
¹Dr. N. Luo, PDF, 2004-05
¹Dr. C. Ma, PDF, 2003-05
Dr. A. Wieser, PDF, 2003-04
L. Dong, MSc, research associate, 2003-04
¹G. MacGougan, MSc, research associate, 2003
A. Morton, senior research associate, 2002-03

⁵⁷ *Institute of Navigation Best Student Paper Sponsorship Award, 1991*

⁵⁸ *Institute of Navigation Best Student Paper Sponsorship Award, 1990*

⁵⁹ *Best Presentation Award, ESA 6th International Colloquium on Scientific and Fundamental Aspects of the Galileo Programme, Valencia, Spain, October 2018*

⁶⁰ *Best Paper Award, 4th International Colloquium Scientific and Fundamental Aspects of the Galileo Programme, Prague, December 2013*

⁶¹ *Best Paper Award, ESA 5th International Colloquium on Scientific and Fundamental Aspects of the Galileo Programme held in Braunschweig, October 2016*

⁶² *China Satellite Navigation Conference 2013 Paper Excellence Award*

⁶³ *Best Conference Paper Award, IEEE- UPINLBS12 Conference, Helsinki, October 2012*

⁶⁴ *Institute of Navigation Burka Award (with two others), for Best Paper published in J. of Navigation in 2011*

PUBLICATIONS – G. LACHAPELLE 1974 - 2021

REFEREED JOURNALS

- Gratton, P., S. Banville, G. Lachapelle and K. O'Keefe (2021) Kinematic Zenith Tropospheric Delay Estimation with GNSS PPP in Mountainous Areas. **Sensors**, MDPI, 21(17), 2018.
- Lachapelle, G., P. Gratton, J. Horrelet, E. Lemieux and A. Broumandan (2018) Evaluation of a Low Cost Handheld Unit with GNSS Raw Data Capability and Comparison with an Android Smartphone. **Sensors**, MDPI, 18, 4185; doi:10.3390/s18124185, 22 pages.
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