

CURRICULUM VITAE

YONG-WON AHN

y.ahn@unb.ca, navleader@gmail.com

Office: (506) 451-6855, Cellular: (506) 260-3411

GNSS Simulation & Hydrography Lab.

Department of Geodesy and Geomatics Engineering

University of New Brunswick, Post Office Box 4400

Fredericton, NB, E3B 5A3, Canada

◆ OBJECTIVE:

- **To obtain a secure position at a University or a research centre to maximize all of my teaching and research experience.**

◆ PROFILE:

- 3+ years of teaching experience for prerequisite courses as a **course instructor** at the University of New Brunswick. Excellent official feedbacks from registered students.
- 6+ years of experience of **generating and integrating cm-level entire topographic plan** of the University of New Brunswick using different types of surveying measurements and assisting other Engineering departments for the plan.
- 10+ years of professional knowledge in **surveying (plane, geodetic, and astronomical), mapping, space geodesy, inertial navigation as well as remote sensing and photogrammetry.**
- **In-depth knowledge of GNSS** software algorithm based on MultiRef™ and FlyKin™ at the University of Calgary, state-of-the-art UNB-RTK™ applied for a real-time gantry-crane auto steering system in South Korea, cm-level UNB-GAPS PPP (precise point positioning) software at the University of New Brunswick, and Bernese GNSS software at the University of Berne (**officially trained for Bernese**).

- 5+ years of experience of simulating many different challenging environments **from terrestrial to space-borne**, and fully analyzing those results using SPIRENT™ GNSS hardware simulators; e.g., for e-POP CASSIOPE space mission test, COM DEV® International (**officially trained**).
- 5+ years of **designing cm-level GNSS RTK platform** using C/C++ and MATLAB which can be applied to photogrammetry, and remote sensing research (e.g. to control for LIDAR data or image mapping) as well as surveying.
- Excellent knowledge **in satellite tracking system** directly applicable to the remote sensing. Designed a satellite tracking software platform written by FORTRAN in 1996.
- 3+ years of integrating up-to-date surveying instruments from Total Stations (to a **3D Laser Scanner**) into GNSS observables.
- 7+ years of analyzing anomalous case of GNSS observables, mainly focused on the anomalous tropospheric (**environmental**) effect.
- **25+ years** of professional experience of managing different operating systems (OS) and technical background of a computer from 8 bits to 32 bits, 64 bits Windows, Linux (Redhat, Madrake, Fedora, Suse, CentOS) and Unix.
- Very strong **programming skills** using MATLAB, Visual MFC, C/C++, VB, Fortran, Assembler, and strong experience with MatFor™, NI™ LabWindows/CVI.
- Very **strong research collaboration** and excellent relationship with Korean government's research centre and other agencies. In 2007, as a student, I successfully introduced **a research project** to the department from my former Korean government research centre, KASI (one of IGS centres), with my co-supervisor.
- Excellent background of **both Geomatics Engineering** and Geomatics-related **Science**.
- Excellent communication skills in both English and Korean.

◆ VOCATIONAL EXPERIENCE:

Contract Instructor (Part-time Faculty) (Jan., 2008~current)	GGE2012 Advanced Surveying, prerequisite course Geodesy and Geomatics Engineering at the University of New Brunswick, Fredericton, New Brunswick, Canada (Official Evaluation: Upon Request. Excellent feedback)
---------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Contract Instructor (Part-time Faculty) (Jan., 2008~May.2008)	GGE2013 Surveying Practicum II, prerequisite course Geodesy and Geomatics Engineering at the University of New Brunswick, Fredericton, New Brunswick, Canada (Official Evaluation: Upon Request. Excellent feedback)
----------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Part-Time Staff | **Technical and Operational Staff**
(Jul. 2007~current) | Geodesy and Geomatics Engineering at the University of New Brunswick,
Fredericton, New Brunswick, Canada

Research Assistant | **Research Assistant**
(Feb. 2005~current) | Geodesy and Geomatics Engineering at the University of New Brunswick
(Aug. 2002~Jan.2005) | Geomatics Engineering at the University of Calgary

Researcher | **Korea Astronomy & Space Institute (KASI), an IGS Data**
(Jan. 1996~Aug. 2002) | **Center**, Daejeon, South Korea

◆ EDUCATION:

Ph.D | **Doctor of Philosophy, Geodesy & Geomatics Engineering**
(Feb., 2005~current) | The University of New Brunswick, Fredericton, New Brunswick,
Canada. (Expected to defend the thesis by early 2011)

M.Sc.E | **Master of Science in Engineering, Geomatics Engineering**
(Jan., 2005) | The University of Calgary, Calgary, Alberta, Canada.

M.Sc | **Master of Science, Space Sciences (Geomatics-related)**
(Aug., 1997) | The Chungbuk National University, Cheongju, South Korea.

B.Sc | **Bachelor of Science, Astronomy & Space Sciences**
(Feb., 1994) | The Chungbuk National University, Cheongju, South Korea.

◆ AWARDS / GRANTS:

(Name of Awards / Location of Tenure / Period – reverse order)

1. ION (The Institute of Navigation) GNSS 2009 Student Paper Competition Winner / ION GNSS 2009, Savannah, Georgia, USA / 2009
2. First Prize for Semi-Annual Technical Conference / University of New Brunswick, McElhanny™ Geomatics Canada / 2009
3. Travel Grants / University of New Brunswick / 2005, 2006, 2007 2009
4. Graduate Research Scholarship / University of New Brunswick / 01/2005 ~ 2008

5. Special Awards, Competition Winner / University of Calgary / 09/2004
6. Graduate Research Scholarship / University of Calgary / 05/2002 ~ 12/2004
7. Special Awards, Competition Winner / University of Calgary / 01/2003
8. Graduate Scholarship / Chungbuk National University / 03/1995 ~ 08/1997
9. Graduated with Honors / Chungbuk National University / 03/1993
10. Undergraduate Scholarship / Nong Hyup Scholarship Association / 08/1990
11. Full 4 Years Undergraduate Scholarship / Korean Ministry of Education / 03/1990 ~ 02/1994

◆ TRAINED SKILLS OR CERTIFICATION:

- **Trained certification of SPIRENT™ STR4760 GNSS Hardware Simulator** with SimGEN software by SPIRENT COMMUNICATION Ltd. in Boston. (5+ years experience, given in 2007)
- **Trained certification of BERNESE GNSS** software by the University of Berne in Bern, Switzerland. (16+ years experience, given in 2005)
- **Diploma in University Teaching (DUT)**, University of New Brunswick. (Oct, 2010)

◆ PROFESSIONAL ASSOCIATIONS:

- Member, The Institute of Navigation (ION),
- Member, The Korean Space Science Society,
- Member, The Korean Geophysical Society.

◆ PROFESSIONAL ACTIVITY

- **Journal Peer Reviewer:** Journal of Geodesy, Springer.

◆ PUBLICATIONS:

Ahn, Y.W. (2009). "Positioning Enhancement Based on a New Weighting Scheme to Solve an Ill-Conditioned Case", *Proceedings of ION GNSS 2009*, Savannah, Georgia, U.S.A. [The Paper Selected for Student Paper Competition, and the paper is invited to the Journal of Navigation]

Ahn, Y.W., D. Kim, and P. Dare (2008). "Estimation of Troposphere Decorrelation Using the Combined Zenith-dependent Parameter", *Proceedings of ION GNSS 2008*, Savannah, Georgia, U.S.A.

Ahn, Y.W., D. Kim, and P. Dare (2007). "Positioning Impacts from Imbalanced Atmospheric GPS Network Errors", *Proceedings of ION GNSS 2007*, Fort Worth, Texas, U.S.A, pp. 2302~2312.

Ahn Y.W., D. Kim, P. Dare (2006), "Local Tropospheric Anomaly Effects on GPS RTK Performance", *Proceedings of ION GNSS 2006*, Fort Worth, Texas, U.S.A, pp.1925~1935.

Ahn Y.W., D. Kim, P. Dare, R. Langley (2005), "Long Baseline GPS RTK performance in a Marine Environment using NWP Ray-Tracing Technique under Varying Tropospheric Conditions", *Proceedings of ION GNSS 2005*, Long Beach, California, U.S.A., pp. 2092~2103.

Ahn. Y.W., G. Lachapelle, S. Skone, S. Gutman, S. Sahn (2005) "Analysis of GPS RTK performance using external NOAA tropospheric corrections integrated with a multiple reference station approach", *GPS Solution*, Vol. 10(3), pp. 171~186.

Alves P., **Y.W. Ahn**, J. Liu, G. Lachapelle, D. Wolfe and A. Cleveland (2004) "Improvements of USCG RTK Positioning Performance Using External NOAA Tropospheric Corrections Integrated with a Multiple Reference Station Approach", *Proceedings of NTM 2004*, San Diego, California, U.S.A., pp. 689~698.

Alves P., **Y.W. Ahn**, and G. Lachapelle (2003) "The Effects of Network Geometry on Network RTK Using Simulated GPS Data", *Proceedings of NTM 2003*, Portland, Oregon, U.S.A., pp. 1417~1427.

Park P.H., U. Chwae, **Y.W. Ahn**, K.H. Choi (2001) "Preliminary GPS results and a possible neotectonic interpretation for South Korea", *Earth Planets Space*, Vol. 53, pp. 937~941.

Lim H.C., P.H. Park, J.U. Park, J.H. Cho, **Y.W. Ahn** (2001) "Precise Orbit Determination of GPS Satellites for Real Time Application", *Journal of Astronomy and Space Science of Korea*, Vol. 18(2), pp. 129~136.

Park P.H., U. Chwae, **Y.W. Ahn**, H.C. Lim, J.U. Park, J.H. Cho (2001) "A Preliminary GPS result on GPS-neotectonic interpretation for South Korea", *Journal of the Geological Society of Korea*, Vol. 37(3), pp. 455~464.

Park P.H., **Y.W. Ahn**, J.U. Park, J.H. Cho, H.C. Lim (2000) "Crustal Velocities around the Korean Peninsula estimated with GPS", *Journal of the Korean Geophysical Society*, Vol. 3(3), pp. 153~160.

Ahn Y.W., C.H. Kim, P.H. Park (1997) "Development of a Software System for Relative Positioning using GPS Phase Observables", *Journal of Astronomy and Space Science of Korea*, Vol. 14(2), pp. 192~199.

[Thesis Paper]

Ahn, Y.W. (2005) "Analysis of NGS CORS Network for GPS RTK Performance Using External NOAA Tropospheric Corrections Integrated with a Multiple Reference Station Approach" M.Sc.E Thesis, UCGE Report Number 20211, Department of Geomatics Engineering, University of Calgary, Canada.

Ahn, Y.W. (1997) "Development of a Software System for Relative Positioning using GPS Phase Observables", M.Sc Thesis, Space Science, Chungbuk National University, South Korea.

Ahn, Y.W. (1994) "Determination of Mean Orbital Elements of NOAA-11 due to the Earth's gravitational potentials considering $J_2 - J_4$ ", Technical Report (TR), Department of Astronomy & Space Science, Chungbuk National University, South Korea.

[Technical Report (specially submitted to USCG)]

Cannon, M.E., G. Lachapelle, **Y.W. Ahn**, P. Alves, P. Lian, J. Liu, A. Morton, M. Petovello and J. Schleppe (2004) "Improving the Existing USCG DGPS Service: Analysis of Potential System Upgrades and Their Effect on Accuracy, Reliability and Integrity", *Report prepared for the United States Coast Guard*, Portsmouth, VA., U.S.A.

◆ DETAILED EXPERIENCE

1) LECTURES (Surveying, Mapping, Photogrammetry and Remote sensing-related)

- Detailed experience for years of many different surveying, remote sensing, mapping-related commercial software, e.g. Trimble Geomatics Office (TGO™), Trimble Total Control (TTC™), Topcon Tools™, NovAtel GrafNav™, Terramodel™, ESRI's ArcGIS™, ArcView™, MicroSurvey®, Trimble Business Center for GNSS baseline processing, topographic plan, 3D mapping, etc.

[Main Focus: Lectures for surveying and 3D digital terrain model (mapping) related disciplines, e.g. GGE2012, and GGE2013 at UNB, and photogrammetry and remote sensing related.]

- Detailed experiences for years in many different “modern” survey equipments such as electronic distance measurements (EDM); Leica™, Trimble™ 5600, Nikon™ etc; experiences for Leica Terrestrial 3D Laser Scanner (ScanStation2™) with Cyclone™ software package.

[Main Focus: Lectures for surveying and 3D mapping related disciplines, e.g. GGE2012, and GGE2013 at UNB.]

- Detailed experience for years in managing and processing using many different kinds of GNSS geodetic receivers from higher-precision to lower-precision, including Trimble™, NovAtel™, Leica™, NavCom™, Javad™, Topcon™, Geodimeter™, Garmin™, Holux™, Microsoft™, etc.

- Innovative and fast learner. All courses are updated whenever there are newer models or newer technology. My own innovative methodologies or approaches are even delivered to this year's students during lecture, for example 3-D mapping technology with photogrammetric images.

- New WebCT learning tools since 2008 (e.g. Blackboard), have been used for each lecture. All lecture notes are set to be downloaded through my personal website outside UNB; www.navleader.com. In addition, I have been very familiar with an interactive teaching tool based on SmartBoard.

- Excellent in students' feedback from the first year of lecturing in 2008. All academic administration has been conducted by me (e.g. marking, grading, and reporting the results to the University).

- Confident of delivering other lectures, e.g. geodesy, precise GNSS algorithm, space geodesy analytic photogrammetry, image mapping, and remote sensing.

2) RESEARCH SKILLS

- 16+ years of detailed responsible experience (source-level) in GNSS high-precision geodetic software; BERNESE GPS (GNSS) software (from version 3.2 to recent version 5.0, fully trained) in a different platform (UNIX, Linux, and Windows); Implemented Bernese Processing Engine (BPE) for routine data processing for one of IGS data centres in early 2001, KASI (Korea Astronomy and Space Institute). Experience of GIPSY-OASIS II and GAMIT.

[Research Focus: map transformation, geodynamics, satellite orbit improvement, earthquake analysis, atmospheric model research (for environmental issues), EOP estimation.]

- 10+ years of full experience in GNSS real-time network or single-baseline RTK software: with the help of Bernese software from KASI, MultiRef™ & FlyKin+™ software from Calgary Geomatics Eng. (until 2005), UNB-RTK™ from UNB. Detailed experience in making Precise Point Positioning (PPP) software with the help of Bernese PPP and UNB-GAPS PPP. 2+ years of full experience in GNSS software simulation using SimGNSS2 (until 2005).

[Research Focus: the development of an improved GNSS software platform.]

- 5+ years of full experience with SPIRENT™ STR4760 GNSS Hardware Simulator (fully trained) with SimGEN software, mostly contracted work by CSA (Canadian Space Agency) for e-POP CASSIOPE space mission, COM DEV® International.

[Research Focus: testing GNSS receivers or signals in extremely harsh environmental condition for terrestrial moving objects and for on-board spacecrafts before the launch.]

- 7+ years of full experience in atmospheric research for regional and global scale, using ray-tracing technique with numerical weather prediction model (NWP), e.g. RUC20, radiosonde observation, and/or GNSS observation from University of Calgary to University of New Brunswick from 2002 to 2010.

[Research Focus: the evaluation of ray-traced tropospheric delay using a numerical weather prediction model and comparison with other meteorological observation, evaluation of positioning improvement by improved atmospheric delay mitigation model.]

3) COMPUTER & PROGRAMMING SKILLS

- System manager and Technical background of a computer work over 25 years from 8 bits (in 1982) computer to 32 bits, 64 bits Windows server, Linux (Redhat, Madrake, Fedora, Suse, CentOS), and Unix (Sun Solaris from UltraSparc Series). Capability of physically disassembling a computer to fully analyze the functionality of parts and repair.
- Excellent programming skills using MATLAB, Visual MFC, C/C++, VB, Fortran. Experience with MatFor™, NI™ LabWindows/CVI.

4) RESEARCH NETWORK & COMMUNICATION SKILLS

- Very strong relationship with many different government research centers, especially KASI (Korea Astronomy and Space Institute, one of IGS data centre), KARI (Korea Aerospace Research Institute), ADD (Army Defense Development), MLTM (Ministry of Land, Transport and Maritime Affairs); very good relations with many colleagues in other agencies or many different counties.