

# TAEHUN YOON

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## EDUCATION

<b>Date</b>	<b>Degree</b>	<b>Institution</b>
September, 2002 – June, 2008	Ph. D. in Geodetic Science and Surveying Dissertation: Object Recognition Based on Multi-agent Spatial Reasoning	The Ohio State University, Columbus, Ohio
March, 1997 – February, 1999	M. S. in Computer Science Thesis: Semi-automatic Building Segmentation from 1m Resolution Aerial Images	Korea Advanced Institute of Science and Technology (KAIST), Taejun, Republic of Korea
March, 1991 – February, 1997	B. S. in Computer Science	Korea Advanced Institute of Science and Technology (KAIST), Taejun, Republic of Korea

## EMPLOYMENT HISTORY

April, 2008 – present	<b>Research Scientist</b> , Department of Geology, State University of New York at Buffalo. Develop and implement algorithms to detect elevation/volume changes in ice sheets by using remote sensing data.
September, 2006 – March, 2008	<b>Research Technician</b> , Department of Geology, State University of New York at Buffalo. Manage facilities in Remote Sensing Lab (RSL). Process space-borne laser altimetry data.
September, 2004 – June, 2005	<b>Graduate Teaching Associate</b> , Geodetic Science and Surveying, The Ohio State University.
September, 2002 – August, 2006	<b>Graduate Research Associate</b> , Byrd Polar Research Center, The Ohio State University. Process space-borne laser altimetry data.
January, 2000 – June, 2002	<b>Senior Researcher</b> , SaTReCi Co. Ltd. Duties included: <ul style="list-style-type: none"><li>- System design including hardware configuration of Korea Multi-Purpose Satellite II Image Receiving System</li><li>- System design including hardware configuration of Integrated Image Archive Managing System</li><li>- Software development of Catalog Browsing Subsystem</li><li>- Software development of Archive Management Subsystem</li><li>- Software development of Road extraction program</li></ul>

- March, 1999 – December, 1999      **Researcher**, Satellite Technology Research Center, KAIST. Duties included:
- System design of Korea Multi-Purpose Satellite I Image Receiving System
  - Software development of Digital Elevation Model (DEM) generation software
  - Research on building detection
- March, 1997 – February, 1999      **Graduate Research Associate**, Department of Computer Science, KAIST. Develop DEM generation software.

## **SCHOLARSHIP RECEIVED**

- March, 1997 – February, 1999      Korean Government Full Scholarship, Computer Science (M. S.), Korea Advanced Institute of Science and Technology
- March, 1991 – February, 1997      Korean Government Full Scholarship, Computer Science (B. S.), Korea Advanced Institute of Science and Technology

## **PROFESSIONAL EXPERIENCE**

- Research and development
  - Developing a new object recognition framework based on multi-agent model to detect multiple objects concurrently from high resolution multi spectral imagery and LiDAR data,
  - Developing new approaches based on multi-sensor data fusion for analyzing multi-sensor, multi-temporal, and multi-scale data sets,
  - Developing methods for computing and calibrating slope of ice sheets from space-borne laser altimetry waveforms.
  - Developing methods for computing elevation/volume changes of ice sheets from satellite images, aerial images, and space-borne laser altimetry data,
  - Developing methods for simulation of laser altimetry waveforms and for interpreting laser altimetry data,
  - Developing methods to extract linear features from LiDAR data and multi/hyper spectral images,
  - Developing methods to detect roads and buildings from high resolution satellite images.
- Experience in the application of
  - Remote sensing, including multi/hyper spectral images, LiDAR, and laser altimetry,
  - Digital image processing and data fusion,
  - Photogrammetry and surface reconstruction,
  - Computer vision,

- Geographical Information Systems (GIS).
- Teaching as Graduate Teaching Associates
  - Digital Photogrammetry I, Department of Geodetic Science and Surveying, The Ohio State University, Autumn 2004,
  - Adjustment computation I, Department of Geodetic Science and Surveying, The Ohio State University, Autumn 2004,
  - Adjustment computation II, Department of Geodetic Science and Surveying, The Ohio State University, Winter 2004,
  - Spectral methods in digital mapping: spectral analysis, Department of Geodetic Science and Surveying, The Ohio State University, Spring 2005

## **AWARDS AND HONORS**

May, 2007	Duane C. Brown Junior Award in photogrammetry, OSU
May, 2006	American Society of Photogrammetry and Remote Sensing (ASPRS) Z/I Imaging Award
2006 – present	Member of Phi Kappa Phi

## **MEMBERSHIP IN PROFESSIONAL SOCIETIES**

2003 – present	American Society of Photogrammetry and Remote Sensing (ASPRS)
2007 – present	Institute of Electrical and Electronics Engineers (IEEE), member of IEEE Geoscience and Remote Sensing Society
2007 – present	American Geophysical Union (AGU)

## **PUBLICATIONS**

### **Papers in Refereed Journals**

T. Schenk, B. Csatho, C. J. van der Veen, H. Brecher, Y. Ahn, and T. Yoon, “Registering imagery to ICESat data for measuring elevation changes on Byrd Glacier, Antarctica,” *Geophysical Research Letter*, 32, L23S05, doi:10.1029/2005GL024328.

B. Csatho, Y. Ahn, T. Yoon, C. J. van der Veen, S. Vogel, G. Hamilton, D. Morse, B. Smith, and V. B. Spikes, “ICESat measurements reveal complex pattern of elevation changes on Siple coast ice streams, Antarctica,” *Geophysical Research Letter*, 32, L23S04, doi:10.1029/2005GL024289.

H.-Y. Lee, W. Park, S.-B. Kim, T. Kim, T. Yoon, D. Shin, and H. K. Lee, "Satellite image processing software for value-added products," *Journal of the Korean Society of Remote Sensing*, vol. 15, no. 4, pp. 339-348, 1999.

H.-Y. Lee, W. Park, S.-B. Kim, T. Kim, T. Yoon, D. Shin, and H. K. Lee, "Development of value-added product generation software from satellite imagery: Valadd-Pro," *Journal of the Korean Association of Geographic Information Studies*, vol. 2, no. 3, pp. 91-100, 1999.

### **Papers in Proceedings**

T. Yoon, and T. Schenk, "Combined spectral and spatial clustering with agents," *Proceedings of ASPRS*, Reno, Nevada, May 1-5, 2006.

Y. Ahn, T. Yoon, and T. Schenk, "Reconstruction of 3D object from imagery by feature-based matching," *Proceedings of IGARSS*, Seoul, Korea, July 25-29, 2005.

B. Csatho, T. Schenk, Y. Ahn, T. Yoon, K. Huh, V. Spikes, and G. Hamilton, "Thickness changes on Whillans and Kamb ice streams derived from airborne and spaceborne laser altimetry," *Proceedings of West Antarctic Ice Sheet Workshop*, Algonkin, VA, September 29 - October 2, 2004, CD-ROM.

D. C. Merchant, T. Schenk, A. Habib, and T. Yoon, "USGS/OSU Progress with Digital Camera in situ Calibration Methods," *XXth ISPRS Congress*, Istanbul, Turkey, TS WG II/1: Real Time Mapping Technologies, pp.19, July 12-23, 2004.

D.C. Merchant, A. Schenk, T. Yoon, and A. Habib, "USGS/OSU Progress with Digital in-situ Calibration Methods," *Proceedings of the ISPRS International Workshop on Radiometric and Geometric Calibration*, Gulfport, Mississippi, pp. 77-82, December 2-5, 2003.

T. Yoon, W. Park, and T. Kim, "Semiautomatic road extraction from IKONOS satellite image," *Proceedings of SPIE: Remote Sensing for Environmental Monitoring, GIS Applications and Geology*, Toulouse, France, vol. 4545, pp. 320-328, September 18-21, 2001.

W. Park, H. -Y. Lee, S. B. Kim, T. Kim, T. Yoon, and T. -G. Kim, "Development of DEM generation software from satellite imagery," *Proceedings of American Society for Photogrammetry and Remote Sensing (ASPRS 2000)*, Washington, USA, 2000.

T. Kim, T. Yoon, and H.-Y. Lee, "Issues on automated DEM extraction from satellite images," *Contributions to Project EMSEA (Environmental Monitoring from Space of East Asia)*, 2000, pp. 210-215.

T. Yoon, T. Kim, W. Park, and T. G. Kim, "Building segmentation using an active contour model," *Proceedings of the ISPRS joint workshop of WG I/1, I/3 and IV/4*, Hannover, Germany, September, 1999.

H. -Y. Lee, W. Park, S. -B. Kim, T. Kim, T. Yoon, D. Shin, Y. R. Lee, and H. K. Lee, "Development of value-added product generation software from satellite imagery," *Proceedings of International Symposium on Remote Sensing (ISRS 1999)*, Kangnung, Korea, pp. 337-342, November, 1999.

T. Yoon, T. Kim, and H. K. Lee, "Semi automatic building segmentation using an active contour model from 1m resolution aerial images," *Proceedings of International Symposium on Remote Sensing*, Kwanju, Korea, pp. 246-251, September 16-18, 1998.

### **Technical Reports**

T. Schenk, T. Yoon, Y. Ahn, W. Lee, P. -L. Lai, and K. J. Park, "Feature extraction and image co-registration for multi-sensor imagery," Project report to ETRI, Korea, January 2006.

T. Schenk, B. Csatho, Y. Ahn, T. Yoon, S. W. Shin, K. I. Huh, "DEM generation from the Antarctic LIDAR Data," Site report to NASA, September 2004.

### **RESEARCH INTERESTS**

- Digital photogrammetry
  - Sensor modeling with linear features
  - Automating photogrammetric processes, i.e. interior orientation, relative orientation, absolute orientation and aerial triangulation
  - Automating reconstruction of 3-D surface from multiple images
- Feature extraction from digital images
- Object recognition from digital images
  - Extracting road networks from aerial / high resolution satellite images
  - Extracting buildings from aerial / high resolution satellite images
- Data fusion
  - Multi-sensor data registration
  - Decision making with different types of information from different data sources

- Analysis of laser scanning data
  - Planar patch extraction from laser scanning data
  - Managing large amount of laser scanning data by using spatial database
  - Simulating returned pulse waveforms of laser altimeter
  - Analyzing returned waveforms of laser altimeter to derive surface characteristics, i.e. slope, roughness, reflectivity and etc.

## **COMPUTER / PROGRAMMING SKILLS**

- C / C++ / Java / Matlab / IDL
- Windows / Unix
- Oracle Database / SQL

## **PROGRAM REGISTRATION**

H. -Y. Lee, W. Park, D. Shin, and T. Yoon, "CGEpiModel - Colinearity based epipolar geometry modeling software," Registration # 2002-01-12-2328 (Computer Science), Korea.

## **SOFTWARE DEVELOPED**

- Archive management subsystem for a satellite image receiving system
- Catalog image browsing subsystem for a satellite image receiving system
- DEM generation software
- Semi-automatic road extraction software
- Semi-automatic building detection software
- Waveform simulation software
- Camera calibration software
- Laser scanning data management software
- ICESat data export software