Graduate Study in Geomatics at Purdue University

Photogrammetry, Geospatial Image Analysis, GIS, Remote Sensing, Geodesy, and Surveying
June 1998

CIVIL ENGINEERING PURDUE UNIVERSITY

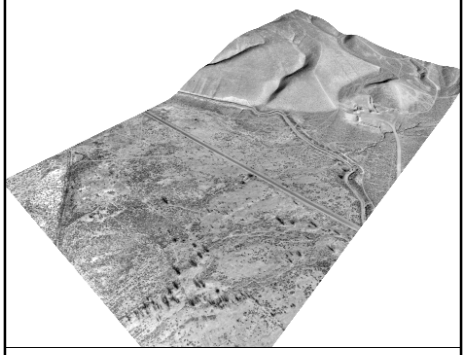
Graduate Study in Geomatics

The Geomatic Engineering graduate program within the School of Civil Engineering at Purdue University provides an excellent environment to pursue coursework and research activities in all of the various sub-disciplines of Geomatics. These include physical and geometric geodesy, satellite positioning,

geospatial image analysis, photogrammetry, image understanding, remote sensing, mapping, land surveying, data adjustment, and geographic information systems (GIS). Other supporting departments on campus provide complementary courses in image processing, signal processing, database systems, computer science, orbit mechanics, remote sensing, radar engineering, and statistics.

Five full time faculty members provide exhaustive coverage of the entire spectrum of subjects that fall within the Geomatics area.

There are well established course curricula for the most popular areas of specialization. These include geodesy, photogrammetry, cadastral surveying, and geographic information systems. Students with cross-disciplinary interests are encouraged, in conjunction with their advisor, to design a program of study tailored for those interests.



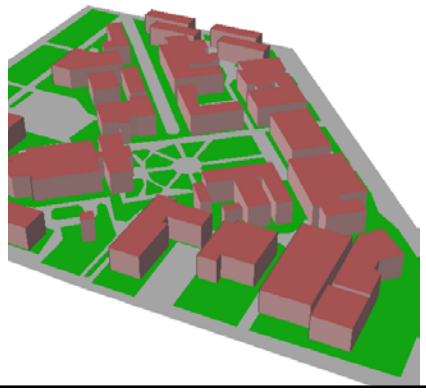
Requirements for admission to the graduate program include a bachelor's degree in science or engineering with a "B" average or better from a recognized institution, acceptable scores on the Graduate Record Exam, and a TOEFL score of 575 or better if the applicant's native language is not english. In addition to the stated requirements it is highly recommended that applicants possess a competence in calculus, linear algebra, computer programming, and general computer skills.

Degree Options

The Master's degree may be obtained via the non-thesis option, 30 credit hours of coursework, or the thesis option, 21 credit hours of coursework and 9 credit hours devoted to writing a thesis. For students in a hurry, the non-thesis Master's program can be completed in a calendar year. The PhD degree requires 48 credit hours of coursework (30 of these may come from the Master's program) as well as a completed research project and a dissertation.

Faculty

James Bethel, PhD Purdue - photogrammetry, semi-automated terrain and feature extraction, sensor modeling and estimation



Steve Johnson, PhD Wisconsin - cadastral surveying, land information systems, photogrammetric analysis, and GIS

Edward Mikhail, PhD Cornell - photogrammetry, data adjustment, feature-based photogrammetry,

invariance models, metric aspects of remote sensing

Jie Shan, PhD Wuhan - digital cartography, GIS, visualization of geographic data, image synthesis, web-based communication of geographic data

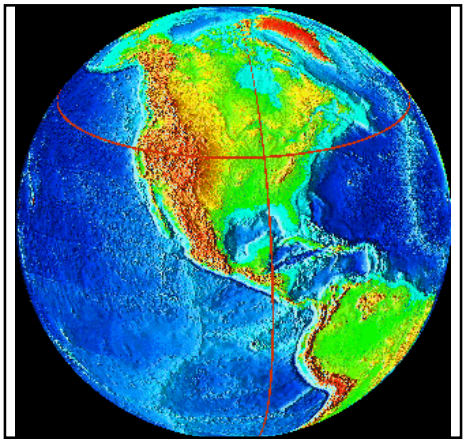
Boudewijn van Gelder, PhD Ohio State - physical and geometric geodesy, GPS, network design, static and dynamic estimation

A permanent adjunct lecturer position brings further depth and scope to the area offerings.

Facilities

Well equipped laboratories permit state-of-the-art data acquisition and processing in all of the areas within geomatics. Photogrammetric equipment includes 4 LH softcopy stereo workstations, 3 analytical plotters, a digital camera and a monocomparator. GIS capabilities include a campus-wide license for

ArcInfo and ArcView software from ESRI. E-size graphic hardcopy output can be produced on a Calcomp color raster plotter. Numerous Sun Ultra and Pentium PC workstations, all with internet access, provide design and development software tools and a rich collection of presentation and analysis software. Programs specifically for data from remote sensing applications include Multispec and ER-Mapper. GPS



equipment consists of single and dual frequency, survey grade receivers as well as navigation grade receivers. Numerous total stations with data collectors, automatic levels, and automatic rod-reading levels are available for field measurement and layout.

Research Opportunities

For students who wish to go beyond taking courses and participate in the development of new technologies in Geomatics, there are numerous research opportunities. Recent research activities at Purdue have included: generation of terrain and features from imagery, geometric modeling of hyperspectral imagery, linear features in photogrammetry, extraction of linear features from imagery using optimization techniques, application of invariance theory in photogrammetry, exploitation of digital video, investigation of polar motion, integration of data from multiple navigation sensors, robust estimation using L1 techniques, and elevation determination from GPS. An ARO funded MURI center is devoted to the rapid generation of terrain and urban feature data from imagery. This multi-university and industry partnership is pursuing the integration of photogrammetry, image understanding, and remote sensing in order to fully exploit modern image sources for the construction of 3D databases, developing and utilizing automated tools wherever possible. Rigorous sensor modeling, hyperspectral pattern recognition, and semi-automated feature extraction are combined to optimize the database construction process.

Financial Aid

A limited amount of financial aid is available in the form of teaching assistantships and research assistantships. The TA positions are typically given to students with some field surveying experience, and the RA positions are typically given to second year students who show an aptitude for research work.

For More Information, Contact

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