

Michigan Technological University Digital Commons @ Michigan Tech

Department of Civil and Environmental Engineering Newsletters Department of Civil and Environmental Engineering

2019

# Special Edition: Surveying Engineering Newsletter

Department of Civil and Environmental Engineering, Michigan Technological University

Follow this and additional works at: https://digitalcommons.mtu.edu/cee-newsletters

Part of the Civil and Environmental Engineering Commons

### **Recommended Citation**

Department of Civil and Environmental Engineering, Michigan Technological University, "Special Edition: Surveying Engineering Newsletter" (2019). *Department of Civil and Environmental Engineering Newsletters*. 9.

https://digitalcommons.mtu.edu/cee-newsletters/9

Follow this and additional works at: https://digitalcommons.mtu.edu/cee-newsletters Part of the <u>Civil and Environmental Engineering Commons</u>



# LEARN. DO. SUCCEED. SURVEYING ENGINEERING (BS) INTEGRATED GEOSPATIAL TECHNOLOGY (MS)

ACCREDITED BY THE ENGINEERING ACCREDITATION COMMISSION (EAC) OF ABET, ABET.ORG (BS)

# ROCK HARBOR PAVILION DESIGN TOPOGRAPHIC SURVEY

A land survey of Isle Royale done by Michigan Tech students



SITUATED IN THE HEART OF LAKE SUPERIOR, Isle Royale is one of Michigan's gems, home to Isle Royale National Park and some of the most picturesque wilderness a person can find. Key access to the Park is at Rock Harbor, where any ferries or seaplanes coming from the Keweenaw Peninsula dock, which makes it one of the most travelled areas on the island. With this in mind, the Park intends to construct a pavilion at Rock Harbor to serve its many visitors. To assist in this endeavor, Michigan Tech Surveying Engineering students Judd Girskis and Kyle Hiltunen teamed up on a Senior Capstone Project to provide a topographic survey of the pavilion site to aid in the design. Once completed, the resulting topographic data would be presented to Purely Pavilions Engineering design team for further design efforts.

Using all the tools available to plan the project, Google Earth imagery and aerial maps proved to be the most helpful in determining what kind of

Continued on page 2



3D SCAN MODEL OF SNOW STATUE AT WINTER CARNIVAL

### **Statues Are Supreme**

AS ALWAYS, the highlight of Winter Carnival at Michigan Tech is the snow statue competition. This popular event draws students, staff, the community and visitors, and features a wonderful variety of games, contests, music and food sold by student organizations.

In keeping with the theme of innovation, the statues got a "high-tech" treatment this year. A statue was laser scanned using Terrestrial Lidar technology. The student-led project used a laser to collect hundreds of thousands of measurements per second. Students then used Terrestrial Lidar to create interactive 3-D models with incredible accuracy.



### **ROCK HARBOR PAVILION**

#### Continued from page 1

surveying equipment would be needed for the job, given the rugged terrain and dense foliage found on the island. An initial search for established survey control found the nearest National Geodetic Survey mark to lie more than six miles away from the site; therefore, the decision was made to establish local control via GPS.

The voyage to the island aboard the Great Lakes Research Vessel RV Agassiz brought the team to the site where it was determined to establish three primary control points via GPS. The topographic data was collected using Trimble R10s, a S5 robotic total station, and TSC7 data collectors. The R10 base station simultaneously logged static data and served as a RTK base for two rovers. Measurements were taken at a sufficient density from the site down to Lake Superior in order to create a complete 3D visualization relative to the harbor; those areas of dense foliage were measured

## This project proved to be a once in a lifetime opportunity while at Michigan Tech.

using the S5 total station. Once all observations were made, the static data collected was processed using Trimble RTX CenterPoint post processing service that yielded adjusted coordinate values for the primary control. The remaining ground and detail shots were adjusted using Trimble Business Center and incorporated into the overall project. Autodesk Civil 3D was used to create the surface model, then a contour map was presented to the Pavilion design group, upon which their foundation design would be based.

Overall, it was found that the topographic data was of sufficient quality to satisfy the project requirements; however, all things being equal, more time on the island would be required to establish a more comprehensive control network in the Harbor. Perhaps as important, this project proved to be a once in a lifetime opportunity at Michigan Tech.



2018 PROGRAM SCHOLARS

### 2018 and 2019 Program Scholar Awards

THE 2018 AND 2019 PROGRAM SCHOLAR AWARDS were given to the following students (2018 students are pictured):

- Surveying Engineering: Kyle Hiltunen and Steven Smendzuik
- Mechanical Engineering Technology: Frances Luo and Alyssa DePauw; Isai Jonatan Hudy-Velasco
- Construction Management: Brandon Taavola and John Batsikouras
- Computer Network and System Administration: Michael Dabish and Dina Falzarano
- Electrical Engineering Technology: Thomas Prica and Spencer Thompson

Thomas Prica (EET) was also selected from the above program scholars as the nominee for the University's 2018 Departmental Scholar Award and Isai Jonatan Hudy-Velasco (MET) was nominated for the University's 2019 Departmental Scholar Award.

### Michigan Tech Alumnus Authors Children's Ice Fishing Adventure Story



#### BENJAMIN FELDHAUSEN, PS,

PE, a 1996 honors graduate with dual baccalaureate degrees in Surveying and Civil Engineering, has published a Northwoods fishing adventure story entitled "Beast from the Boondox." The exciting storyline rhymes, with imaginative color illustrations that reflect a legendary tale of swamp creatures and frenzy during an Upper Peninsula blizzard. He has developed an encouraging program that has fascinated thousands of children as part of various reading, educational and speaking venues, in which he emphasizes the importance of education, safety, sportsman etiquette and respect for the environment.

Visit beastfromtheboondox.com for additional details.

Graduates receive excellent job offers and great starting salaries as they enter their careers.

# **ALUMNI NOTES**

### John D. Matonich, Jr., PS, Named to Environmental Science Advisory Board

JOHN MATONICH of Marenisco, Michigan was appointed to the



Environmental Science Advisory Board by former Governor Rick Snyder of Michigan. Matonich, who is retired CEO,

is also a Board Chair for Rowe Professional Services Company, Inc. and previously served as Chair of the Michigan Natural Resources Commission. Matonich is a licensed Professional Surveyor and holds a Bachelor of Science degree in Land Surveying from Michigan Tech. He also serves on Michigan Tech's Surveying Engineering Advisory Board. Pursuant to Public Act 269 of

 Advisory Board was created
within the Michigan Department of Technology, Management, and
Budget to advise the Governor and the state of Michigan on issues affecting the protection of the environment and the
management of natural resources
in this state.
The Board is comprised of

The Board is comprised of nine members appointed by the Governor with expertise in a scientific field or other discipline that the Governor considers appropriate.

2018, the Environmental Science

"Each individual has a unique skill set that gives me confidence they will work well together to ensure Michigan's natural resources and environment are preserved and protected," Snyder commented.

### **National Surveyors Week**

### THE NATIONAL SOCIETY OF

PROFESSIONAL SURVEYORS (NSPS) has been promoting National Surveyors Week (March 17-23, 2019) which is designed to raise awareness for the surveying profession with posters and publicity on a national scale since the week's inception several years ago.

Locally, the Michigan Society of Professional Surveyors (MSPS) sent out historical surveying articles daily during the week to all MSPS members and to Surveying Engineering faculty at Michigan Tech to keep surveying in the spotlight.



# WHAT'S NEW?

### **New Faculty in SE and IGT**

DR. ROMAN SHULTS joined the Bachelor of Science degree program in Surveying Engineering and the Master of Science degree program in Integrated Geospatial Technology as a visiting professor. He earned his Doctor of Technical Sciences (PhD) in "Geodesy, Photogrammetry and Cartography" from Kyiv National University of Construction and



He received his master's and bachelor's degrees from that institution as well. Prior to coming to

Architecture.

Michigan Tech, Shults served as dean of Faculty GIS and Territories Management at Kyiv National University of Construction and Architecture. He also served as a professor, assistant professor and researcher prior to his appointment as dean.

He is the author of 170 scientific works and holds 19 patents for invention. He has twice served as

chairman of the Scientific and Methodical Commission of Ministry of Science and Education of Ukraine.

## Geoinformatics Emphasis Offered to Surveying Engineering Students

IN FALL 2018, the ABET accredited BS in Surveying Engineering program at Michigan Tech started delivery of a

new "Geoinformatics" emphasis area. The purpose is to broaden traditional land surveying training and education by opportunities coming from new emerging geospatial information science and technology areas such as: Earth Observation Systems, UAV and LIDAR sensors, geospatial big data and virtual/augmented reality and visualization. While we keep our highly reputable 35-year "Professional Surveying" emphasis area that directly leads its graduates to become licensed Professional Surveyors (PS), the new emphasis area opens an opportunity and path for other careers which are

associated with professional certifications such as ASPRS **UAS Mapping Scientist, ASPRS** Certified Photogrammetrist, Certified Geographic Information Systems (GIS), Professional (GISP), among others. The curriculum is comprised of four new courses: Geospatial Monitoring; Geospatial Data Mining and CrowdSourcing; Hydrographic Mapping; and Cadaster and Land Information Systems. By establishing this emphasis area, we are opening a window of possibilities to a very highly demanded diverse geospatial workforce to both traditional surveying engineering students who are eager to work outside and high-tech oriented students who prefer to work with a computer in the office and often even remotely from home. Both emphasis areas are eligible for the accelerated option of the MS in Integrated Geospatial Technology.

Eigene Loyie + Lenet Middinet + Davit Akhander Surveying Instruments and Technology

DR. EUGENE LEVIN, along with a team of surveying experts, Leonid Nadolinets and Daulet Akhmedov, published the book (pictured), which gives surveying students and practitioners profound understanding of how surveying instruments are designed and operated based on surveying instrument functionality, along with modern UAV systems. ISBN-10:1498762387

# New Geospatial Data Act That Will Bring Changes to America and the World

ON OCTOBER 5, 2018, President Donald Trump, along with 11 high ranking officials, signed the FAA Reauthorization. It has subtle F that is establishing a Geospatial Data Act (GDA). (congress.gov/ bill/115th-congress/housebill/302/text#toc-H5B65F4B94E6 C4681A92559A35AECC991) The GDA will create entrepreneurs, new products and services, and job growth, which will generate revenue. Many infrastructurerelated bills have tax incentives built into them. Money will come from the economic restructuring of trade deals currently taking place with many of the United States' trading partners. Money will also come from America's oil and gas renaissance.



Below are the primary tenets of the GDA:

- It establishes the Federal Geographic Data Committee (FGDC)
- It establishes the National Geospatial Advisory Committee (NGAC)
- It establishes the National Spatial Data Infrastructure (NSDI)



- It establishes the National Spatial Data Asset data themes (NSDI-dt)
- It establishes GeoPlatform as the clearinghouse for geospatial data
- It sets Geospatial Data Standards

Senator Orrin Hatch, who introduced the bill to the Senate four times since 2015, called it, "...a good-governance bill that will bring structure and Congressional oversight to federal geospatial data spending, accounting, and usage. The GDA will:

- Dramatically reduce duplicative spending and, according to the Government Accountability Office, save the federal government billions of dollars;
- Bolster federal emergency response capabilities by enabling smarter, more efficient disaster relief;
- Improve infrastructure planning nationwide by

providing state and local governments with access to higher-quality, more robust data.

The bill is supported by over 65 universities, industry groups, trade associations, companies, and state and local stakeholders, including the National Association of Counties and National League of Cities."

Michigan Technological University is involved in the geospatial workforce training towards Surveying Engineering, Integrated Geospatial Technology and Professional Masters in GIS programs. Many other programs on campus have geospatial elements of the research and education. As a part of national and international geospatial science and technology communities, we may reflect Act awareness into geospatial curriculums and discover new research and development opportunities associated with GDA implementation.



# **DOUGLASS HOUGHTON STUDENT CHAPTER OF THE NATIONAL SOCIETY OF PROFESSIONAL SURVEYORS**

GLO Workshop 2018–Sylvania Wilderness Tract

**SURVEYING ENGINEERING** at Michigan Tech has always been an adventure and learning experience for its students. This past October was no exception.

Each year, the Douglass Houghton Student Chapter of the National Society of Professional Surveyors (NSPS) sponsors a General Land Office (GLO for short) survey workshop for the Surveying Engineering students, as well as local Professional Surveyors from Michigan and Wisconsin where each is exposed to a search for, and perpetuation of, an original GLO corner. Organized and conducted by Pat Leemon, PS (retired, from the USDA Forest Service, Ottawa National Forest), the two-day workshop includes an evening seminar, giving the origin, history, and survey of the original corner. Day two is an actual trip to the field to search for, recover, and perpetuate the corner. This year's corner, located within the rugged and remote Sylvania Wilderness and Recreation Area (near Watersmeet, Michigan), proved to be elusive, but after a two-hour hike to the search area located by GPS, work could begin.

Armed with the original Government Surveyor's notes from 1850, a subsequent Surveyor's notes from 1917, aerial imagery of the area, and additional tools of the trade, the search for the Meander Corner



Armed with the original Government Surveyor's notes from 1850 and 1917, aerial imagery of the area, and additional tools of the trade, the search for the Meander Corner on the shores of Crooked Lake began.

![](_page_7_Picture_1.jpeg)

on the shores of Crooked Lake began. Locating any evidence of the feature calls and original bearing trees was first on the list to get as close to the location of the corner as possible. Second, referring to the Surveyor's notes from 1917 indicated that the corner had been monumented with an iron pipe with brass cap. After a fair amount of searching, remains of the two bearing

trees from the original 1850 survey were recovered. Using this information together with the feature calls, the iron pipe with brass cap set in 1917 was recovered! In true USDA Forest Service fashion, the corner was re-witnessed, documented, and GPS'd, so as to be included in the state's Survey and

Remonumentation Program.

Touted as a "once in a lifetime opportunity," the GLO workshop continues to be held each year and serves as an unique and fulfilling learning opportunity for students and professionals alike.

![](_page_7_Picture_6.jpeg)

### Peggy Gorton Receives "Making a Difference" Legacy Award; Two Other Staff Honored

**PEGGY GORTON** has built a legacy within the University, the School of Technology, and

Geological and Mining Engineering and Sciences (GMES) over her 40+ years of service. During alumni weekend this

![](_page_7_Picture_10.jpeg)

last August, an alum returning to GMES worked to track down Peggy because she had been such a positive and encouraging force for him. She has helped students find places to live and provided lunches and snacks out of her own pocket.

In addition to Gorton, two other School of Technology staff members were nominated for awards. Pammi Washuleski, Office Assistant and Nicholas Hendrickson, Operations/Facilities Supervisor of the Machine Shop, were nominated in the categories "Serving Others" and "Above and Beyond" respectively.

FACULTY, FALL 2018

![](_page_7_Picture_14.jpeg)

# FROM THE DEAN

## Dear Alums, Friends, and Students:

IT IS A PLEASURE to share with you a brief selection of the news and accomplishments from our students and faculty in Surveying Engineering and Integrated Geospatial Technology. As a new Dean, it has been an honor to learn from and become a member of this commUNITY that is so dedicated to the professional, technical, and social development of our students to graduate into the changing needs of industry.

We learned in December that the administrative reporting structure for the Surveying Engineering BS program and the Integrated Geospatial Technology MS program will be moving into the Department of Civil and

![](_page_8_Picture_4.jpeg)

Environmental Engineering. The IGT program will be restructured to include the interdisciplinary executive committee to draw in students from across campus.

As our program continues to grow and gain prominence, we hope you will partner with us in a way that is highly personal and meaningful to you (scholarships, lab equipment, internship experiences, virtual tours of your facilities, safety modules, etc.) and that has a significant impact on student development.

Feel free to reach out to us. We would love to hear and learn from you!

### Best Regards,

Adrienne Minerick Dean, School of Technology

### RELATED ACCREDITED PROGRAMS

# COMPUTER NETWORK AND SYSTEM ADMINISTRATION

Computing Accreditation Commission (CAC) of ABET

#### **CONSTRUCTION MANAGEMENT**

American Council for Construction Education (ACCE)

#### ELECTRICAL ENGINEERING TECHNOLOGY

Engineering Technology Accreditation Commission (ETAC) of ABET

### MECHANICAL ENGINEERING TECHNOLOGY

Engineering Technology Accreditation Commission (ETAC) of ABET

![](_page_8_Picture_19.jpeg)

![](_page_8_Picture_20.jpeg)

Michigan Technological University is an Equal Opportunity Educational Institution/Equal Opportunity Employer, which includes providing equal opportunity for protected veterans and individuals with disabilities.