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# MICHAEL J. STAREK

## Curriculum Vitae

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### EDUCATION

#### University of Florida

Ph.D. Civil Engineering, 2008

*Emphasis: Geosensing Systems Engineering*

#### Texas A&M University - Corpus Christi

M.S. Computer Science

B.S. Environmental Science, minor in Math, *summa cum laude*

### RESEARCH FOCUS

- Geodetic imaging and remote sensing techniques
  - Lidar systems and data processing
  - Structure-from-motion photogrammetry
  - UAS for surveying and mapping
- Spatial analysis
- Machine learning and pattern recognition
- Geomatics solutions for natural and built resource monitoring

### ACADEMIC APPOINTMENTS

- **Associate Professor of Geospatial Systems Engineering** January 2014 – Present  
Texas A&M University-Corpus Christi (TAMUCC)  
Core Programs: Geospatial Systems Engineering (BS-MS), Geospatial Computer Science (PhD)  
Affiliate: Coastal and Marine System Science (PhD)  
Coordinator of Geospatial Computer Science PhD Program
- **Associate Research Scientist/Visiting Assistant Professor** June 2012 – Dec. 2013  
Harte Research Institute for Gulf of Mexico Studies at TAMUCC
- **Postdoctoral Research Associate\*** July 2011 – May 2012  
North Carolina State University (NCSU), MEAS Department  
\*Department faculty vote approved change of role to Research Assistant Professor in Nov. 2011
- **National Research Council (NRC) Postdoctoral Fellow** June 2009 – June 2011  
US Army Research Office (ARO), Host: North Carolina State University  
Advisors: Dr. Russell Harmon, former Director of ARO Terrestrial Sciences Division, and  
Dr. Helena Mitsova, Geoinformation Science and Environmental Modeling Lab, NCSU
- **Graduate Research Assistant** May 2004 – May 2009  
University of Florida, Gainesville FL  
Joint member of Adaptive Signal Processing Laboratory and the Geosensing Engineering and  
Mapping Center with the National Center for Airborne Laser Mapping (NCALM)  
Advisor: Dr. K Clint Slatton, ECE and CCE Departments, PECASE award winner

## RESEARCH LAB AND INSTITUTE AFFILIATIONS

Director, Measurement Analytics Lab (MANTIS)

- <http://mantisresearch.org/> [[link](#), website in beta]
- MANTIS YouTube channel [[link](#)]

Chief Research Scientist, Conrad Blucher Institute for Surveying and Science (CBI)

- Associate Director of Geospatial Computing Lab from 2014-2016
- <http://cbiweb.tamucc.edu/> [[link](#)]

Affiliate Research Faculty, Lone Star UAS Center of Excellence & Innovation (LSUASC)

- <http://lsuasc.tamucc.edu/> [[link](#), FAA designated UAS test site]

## AWARDS AND RECOGNITION

- Blue Marble Scholarship Award for 2019/20, American Society of Photogrammetry and Remote Sensing. (2019). Won by my student Kelsi Schwind.
- Paul R. Wolf Memorial Scholarship in Photogrammetry and Remote Sensing, American Society of Photogrammetry and Remote Sensing. (2019). Won by my student Isabel Garcia.
- 2nd Place for Best Poster Presentation, 2018 HENAAC Great Minds in STEM Conference. (2018).
- Best paper award sponsored by Monsanto at the International Society for Optics and Photonics (SPIE) Defense + Commercial Sensing Conference, Anaheim, CA. "UAS imaging for automated crop lodging detection: a case study over an experimental corn field" presented in the Autonomous Air & Ground Sensing Systems for Agricultural Optimization & Phenotyping II (2017)
- First Place Poster award to Laura Carbajal (MS Student) and M.J. Starek (mentor) at the USDA HSI Meeting, Albuquerque, New Mexico. Poster entitled "Evaluation of UAS-Based Remote Sensing for Measuring Forage Properties at an Experimental Rangeland", Feb. 16-18 (2017)
- Outstanding Reviewer for ASCE Journal of Surveying Engineering (2015)
- Lights & Mirrors Award, USACE Airborne Coastal Mapping and Charting Workshop (2011)
- Recipient of two National Research Council Postdoctoral Fellowship awards to carry out independent research supported by the US Army Research Office (ARO) and the Air Force Research Lab (AFRL); accepted ARO award (2009)
- University of Florida Alumni Fellowship (2004-08)
- Chi Epsilon Civil Engineering Honor Society (inducted in 2007)
- Texas A&M University Dept. of Science & Technology Graduate Scholarship in Computer Science for Excellence in Academic Achievement and Research (2001-2002)

## RESEARCH ACTIVITIES

### Funded Projects

[Summary: ~\$7M total, ~\$900K total as PI]

### Sponsored Projects

- (Co-PI) *Regional Geospatial Modeling for Gulf of Mexico*, NOAA NGS, multi-university consortium, 2019-2021. (currently in Year 2), TAMUCC total of ~\$2,000,000
- (PI TAMUCC) (Main PI TTI) *Guidance for the Use of UAS During Suboptimal Environmental Conditions*, TxDOT, 2019-2020, \$218,887.00 (TAMUCC only).
- (Co-PI) *Escalating Mobile Lidar Capabilities for Geospatial Sensing Education and Research*, TRDF. 2019-2020
- (Co-PI) *Mobile Geospatial Sensing for 3D Campus Survey and Indoor Localization*, TRDF. 2019-2020

- (PI) *Re-establishment of a Monitoring Benchmark to Study Marsh Resilience in the Mission-Aransas Natural Estuarine Research Reserve (NERR)*, National Academies of Science, 2018-2019, \$41,084.
- (Co-PI) *Improving Oil Spill Response through Integrated Geospatial Reporting Tools and UAS Protocols*, Texas General Land Office, Oil Spill Research and Development, 2017-2019, \$339,074
- (PI) *Remote Sensing by UAV to Detect Sugarcane Aphid in Sorghum*, USDA ARS Cooperative Agreement, 2016-2017, \$18k.
- (PI TAMUCC) *Unmanned Aircraft System Technology Education Consortium*, NSF ATE, collaboration with Del Mar College (lead), 2016-2019, \$758,000 total, TAMUCC total of \$147,000.
- (Co-I, faculty affiliate) *Experiential Training in Use of Unmanned Aerial Systems (UAS) Technology for Agriculture Applications*, USDA, 2016-20, multiple universities, TAMUCC total of \$504,629.
- (Co-PI) *Development of an Integrated Gas Monitoring and Source Identification Unmanned Aircraft System for Exploration, Compliance and Assessment*, NSF, 2016-18, \$539,998.
- (Co-PI) *Regional Geospatial Modeling for Gulf of Mexico*, NOAA NGS, multi-university consortium, 2013-2018, TAMUCC total of \$2,250,000
- (PI) Tier 1 UAS Analysis for Nueces County, Nueces County, 2017-18, \$16,959.
- (PI) *UAS Data Acquisition for Corn Monitoring*, Texas A&M University, 2017, \$9000.
- (PI) *Funding to support UAS Ag. Research*, Texas A&M AgriLife Research, 2016-17, \$20,000.
- (PI) *Development and Validation of UAS-based Sensing Platform for Monitoring the Growth and Health of Cotton*, Texas State Support Committee Cotton Inc, 2016-17, \$30,000.
- (Co-I) *Improving Sustainability of Livestock and Wildlife Management Using Remote Sensing Technology*, Texas A&M AgriLife Research Sustainable Solutions for Beef Production Systems (FY'16) Innovation Award, 2015-16, \$25,000.
- (PI) *UAV mapping of North Padre Island Beaches*, City of Corpus Christi, 2015-16, \$20,000.
- (PI) *UAV Survey to assess wellhead placement*, British Petroleum, 2015, \$7500.
- (PI) *UAV survey of sea grass for prop scar mapping*, Texas Parks and Wildlife Dept., 2015, \$5000.
- (PI) *Development of Probabilistic Clutter Maps within Complex Forested Terrain*, USACE ERDC, 2014-2016, \$109,000.
- (PI) *High-Resolution Lidar Observations of Rookery Islands to Define a Monitoring Benchmark*, Texas General Land Office NOAA CMP, 2014-2016, \$82,198
- (Co-PI) *Terrain Dynamics Analysis Using Space-Time Domain Hypersurfaces and Gradient Trajectories Derived from Time Series of 3D Point Clouds*, ERDC, 2011-2013, \$246,000
- (PI) *Maintenance Requirements and Accessory Equipment in Support of a HD Survey System*, Defense University Research Instrumentation Program, 2010-2011, \$15,000
- (PI) *Lidar Acquisition and Information Extraction Methods for Multi-scale Terrain Monitoring*, National Research Council (NRC) and US Army Research Office (ARO), 2010-2011, \$68,000
- (PI) *Feature Extraction and Stochastic Estimation of Coastal Terrain Evolution Using High Resolution Lidar Measurements*, NRC/ARO, 2009-2010, \$66,000.

#### Non-sponsored Projects [internal funding]

- (PI) *Campus Surveying Project*, 2014-2020, ~25k/yr, \$150K total.
- (PI) *Development of Geospatial Techniques for a Marsh Observatory through the Integration of UAS and Field Measurements*, Texas Research Development Funding (competitive), 2014-15, \$20k.

## **Memorandum of Understanding (MOU)**

- Co-Investigator in development of an MOU between UASCE New Orleans District and Conrad Blucher Institute at TAMUCC, March 18, 2015. Focus is on UAS surveying technology.

## **Selected Collaborators**

Bruce Blundell (ERDC Geospatial Research Lab), Andrew Kennedy (Notre Dame), Mike Brewer (A&M AgriLife), Norman Elliott (USDA), James Gibeaut (Harte Research Institute), Craig Glennie (University of Houston/NCALM), Russell S. Harmon (ERDC International Research Office Director), John G. Harris (University of Florida), Heezin Lee (University of California at Berkeley), Helena Mitasova (North Carolina State University), Ramesh Shrestha (University of Houston/NCALM)

## **TEACHING ACTIVITIES**

### **Courses of Instruction**

- *GISC 4431: Remote Sensing (undergraduate)*
- *GSEN 6390/GSCS6390/CMSS 6330: Spatial Systems Science (graduate),*
- *GSEN 6385: Photogrammetric Engineering and Lidar Scanning (graduate)*
- *GSCS 6102 Geospatial Computing Sciences Graduate Seminar (1 hr lecture), Fall 2016*

### **Certification and Training**

- *Certificate of Course Design and Development in Online Instruction* by the Office of Distance Education and Learning Technologies, TAMUCC, completed on May 26, 2017.
- *Certificate of Course Delivery and Peer Review in Online Instruction* by the Office of Distance Education and Learning Technologies, TAMUCC, completed on May 26, 2017.
- Completed 3-day *Challenge Based Instruction Faculty Development Workshop*, TAMUCC, 2015.
- Completed TAMUCC Faculty Research Development Program, selected by the Dean, 2015
- Completed *Blackboard Course Development* training, TAMUCC, 2014.
- Completed a six-course workshop entitled *Certification in Teaching Techniques* through the NC State University Office of Postdoctoral Affairs, 2010.

### **Student Mentoring**

Serve as advisor for students in Geographic Information Science (GISC) BS program, Geospatial Systems Engineering (GSEN) MS program, Geospatial Computing Sciences (GSCS) PhD and Coastal Marine System Science (CMSS) PhD programs. Serve on committees for MS students in Environmental Science (ESCI) and CMSS.

*Completed PhD Students as Chair* [since 2014: 1 total]

*Completed PhD Students as Committee Member* [since 2014: 5 total]

*Completed MS Students as Chair* [since 2014: 14 total, 7 theses]

*Current Graduate Students as Chair* [14 total]

- PhD students: 4, MS students: 8

*Undergraduate Student Researchers and Internships* [since 2014: 10 total]

### **Postdoctoral Mentoring**

- Dr. Tianxing Chu, Ph.D. in Photogrammetry and Remote Sensing from Peking Univ., 2016-2018

## **PROFESSIONAL SERVICE ACTIVITIES**

### **Society Membership and Committee Service**

- United Nations GGIM Academic Network Member, 2018-Present
- American Geophysical Union (AGU), 2005-Present
- American Society of Civil Engineers (ASCE), 2014-Present
  - Utility Engineering and Surveying Institute Surveying Committee, 2015-Present
- American Society for Photogrammetry & Remote Sensing (ASPRS), 2005-Present
  - Chair of RSAD Marine Working Group, October 2016-Present
- American Shore and Beach Preservation Association (ASBPA), 2012-Present
  - ASBPA Students and New Professionals Committee, 2013-2016
- Association for Unmanned Vehicle Systems (AUVSI), October 2016-Present
- Institute of Electrical and Electronics Engineers (IEEE), 2007-Present
  - Geoscience and Remote Sensing Society
  - IEEE Corpus Christi Treasurer, 2015-2017, IEEE Corpus Christi Secretary, March 2017-Present
- UNOLS Scientific Committee on Oceanographic Airborne Research (SCOAR), 2017-Present
- UNAVCO University Representative for TAMUCC, 2015-Present

### **Reviewer Service**

#### *Journals*

- ASCE Journal of Surveying Engineering
  - Editorial board (January 2016-present)
- IEEE Transactions in Geoscience and Remote Sensing (TGRL)
- IEEE Geoscience and Remote Sensing Letters (GRSL)
- IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS)
- Remote Sensing (open-access online journal)
- SPIE Journal of Applied Remote Sensing
- Photogrammetric Engineering and Remote Sensing (PE&RS)
- Applied Geomatics
- Geoinformatica
- International Journal of Remote Sensing
- Journal of Coastal Research (JCR)
- Shore & Beach
- Textbook, Blue Book II - Airborne Hydrographic Laser Scanning (2015)

#### *Federal Agencies*

- National Oceanic and Atmospheric Administration (NOAA)
  - including for National Geodetic Survey (NGS)
- U.S. Army Research Office (ARO)
- U.S. Army Corps of Engineers (USACE) Engineer Research and Development Center (ERDC)
- United States Geological Survey (USGS)
- U.S. Fish and Wildlife Service (USFWS)
- Netherlands Space Office (NSO)

### **Scientific Conference Committees and Sessions**

- Panelist, 19th Annual USACE JALBTCX Airborne Coastal Mapping and Charting Workshop. June 2018.
- Track Organizer, 17th Conference on Artificial and Computational Intelligence and its Applications to the Environmental Sciences, AMS Annual Conference 2018. January 2018.

- Session Co-Organizer and Chair: The Future Is Here and Changing Our Way of Life: Development and Applications of Unmanned Aircraft System (UAS) Technology, session accepted for SACNAS National Conference, Salt Lake City, Utah, October 2017.
- Session Organizer and Chair (upcoming): Unmanned Aircraft Systems for Observing and Analyzing Coastal Systems, session accepted for AGU Fall Meeting, New Orleans, LA, Dec., 2017
- Session Co-Chair (upcoming): 17th Conference on Artificial and Computational Intelligence and its Applications to the Environmental Sciences, AMS Annual Conference, Austin, TX, January, 2018.
- Session Chair: Agriculture Applications III, Oral, IEEE IGARSS 2017, upcoming, July 27, 2017
- Session Organizer and Chair: Autonomous Systems for Coastal & Estuarine Processes, AGU Ocean Sciences, New Orleans, LA, Feb. 23, 2016
- Session Chair: Photogrammetry and Point Clouds, ASPRS IGTF, Fort Worth, TX, April 11-15, 2016
- Session Chair: Considerations for LiDAR Use in Sea Level Rise, ASPRS IGTF, Fort Worth, TX, April 11-15, 2016
- Session Chair: Conversations with Engineers, Society for Advancement of Chicanos and Native Americans in Science (SACNAS) Conference, Anaheim, CA, 2016
- Session Chair: Conversations with Engineers, Society for Advancement of Chicanos and Native Americans in Science (SACNAS) Conference, Washington DC, 2015
- Session Chair: Dynamics of Coastal Processes, ASPRS IGTF, 2014
- Technical Program and Organizing Committees: IEEE GreenTech, Corpus Christi, TX, 2014
- Technical Program and Organizing Committees: IEEE Ubiquitous Positioning Indoor Navigation and Location, Corpus Christi, TX, 2014
- Technical Program Committee (reviewer): Society for Advancement of Chicanos and Native Americans in Science (SACNAS) Conference, 2013, 2014, 2015
- Technical Program Committee (reviewer): IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017

#### **International Conferences Attended**

- ISPRS Geospatial Week, Wuhan, China, September 18-22, 2017
- International Lidar Mapping Forum, Denver, CO, 2017
- AGU Fall Meeting, San Francisco, CA, attended eleven times between 2005-Present
- IEEE IGARSS, Milan, Italy, 2015
- International Conference on Ubiquitous Positioning, Indoor Navigation, and Location-based Services (UPINLBS), Corpus Christi, TX, 2014.
- AGU Meeting of the Americas, Cancun, Mexico, 2013
- IEEE International Conference on Image Processing (ICIP), San Antonio, TX, 2007.

#### **Workshop Development**

- Workshop Organizer, Del Mar and TAMUCC UASTEC Stem night. (October 2018).
- Instructor/Co-Organizer: 1<sup>st</sup> Annual USDA UAS in Agriculture Field Day, TAMU AgriLife Research Center, Robstown, TX, June 13, 2017.
- Instructor/Co-Organizer: Fundamentals of SIT Exam, Corpus Christi, TX, one-day course, 2015.
- Instructor/Co-Organizer: Fundamentals of SIT Exam, Corpus Christi, TX, one-day course 2014.
- Instructor/Co-Organizer: Student Career Development Workshop at ASBPA National Conference, Virginia Beach VA, October 14, 2014.
- Instructor/Co-Organizer: Student Career Development Workshop at ASBPA National Conference, South Padre Island TX, October 22, 2013.
- Instructor/Co-Organizer: Lidar Workshop for US Army GEOINTEL, Fort Bragg, NC, March 22, 2012.

### **Invited Seminars and Panels**

- Presenter and Panelist: "3D Geospatial Information for Sustainable Coasts: Emerging Solutions and Applications," United Nations World Geospatial Information Congress, United Nations, Dequing, China. November 21, 2018.
- Seminar: "UAS for Coastal and Marine Applications," University of Florida Geomatics Program. November 16, 2018.
- Seminar: "Hyperspatial 3D Point Clouds from Lidar and Drones: Applications to Wetland Segmentation and Crop Development," University of Houston and National Center for Airborne Laser Mapping, Houston, TX. November 7, 2018.
- Seminar: "Eyes in the Sky" UAS over South Texas," North Carolina State University Center for Geospatial Analytics, Raleigh, NC. November 1, 2018.
- Seminar: "UAS Over the Skies of South Texas, State" Laboratory for Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS), Wuhan University, Wuhan China, Sep. 23, 2017.
- Panelist: "Unmanned Aircraft Systems (UAS) for Coastal Observation," Global Marine Sustainability Workshop, The Scottish Assoc. for Marine Science, Oben, Scotland, Sep. 21, 2016.
- Seminar: Managing Natural Resources with UAVs Symposium, Texas A&M University-Kingsville, Sep. 16, 2016.
- Panelist: "Drones: What to Know Before You Fly" Lunch and Learn Workshop, Del Mar College Center for Economic Development, Corpus Christi TX, August 17, 2016.
- Seminar: University of Florida, School of Forest Resources and Conservation, May 25, 2016.
- Seminar: Natural Resource Management with Remote Sensing Symposium, Texas A&M AgriLife Research and Extension Center, Robstown TX, Feb. 4, 2016.
- Panelist: Undergraduate Research Day at the Capitol, Austin, TX, March 28, 2015.
- Seminar: Oregon State University, School of Civil and Construction Engineering, March 11, 2015.
- Seminar: North Carolina Society of Surveyors, October 9, 2014.
- Seminar: University of New Hampshire Center for Coastal & Ocean Mapping, November 1, 2013.
- Seminar: University of Florida, Geomatics program, May 20, 2013.
- Seminar: Harte Research Institute for Gulf of Mexico Studies Seminar Series, March 10, 2013.
- Seminar: USGS/USF Marine Science Institute Seminar, March 2012.
- Seminar: Harte Research Institute for Gulf of Mexico Studies Seminar Series, October 2011.
- Seminar: Univ. of Houston Dept. of Civil Engineering Seminar Series, Sep. 2011.
- Seminar: ASPRS GeoBytes Online Seminar Series, June 30, 2017.
- Seminar: Urban and Regional Information Systems Association (URISA) of Texas Online Seminar Series, September 27, 2016.

### **Selected Media**

- April 13, 2017 – TAMUCC.edu feature article, "Starek named to nationally-renowned committee," [link to article](#)
- September 26, 2016 – NSF UASTEC Grant Award Announcement, covered by local TV affiliates
- October 5, 2016 – TAMUCC.edu feature article, "Professor Uses Laser Scanning to Monitor Impact of Sea Level Rise to Marshes", [link to article](#)
- April 25, 2016 –Geospatial Solutions Magazine article, "Drone survey of seagrasses tested for Texas Parks & Wildlife", [link to article](#)
- Feb. 24, 2016 -Texas Farm Bureau, video feature on UAVs for Agriculture, aired across state and several stations in Georgia including WTOC-SAV(CBS), WMAZ(CBS) , WAGA-ATL (FOX)

- May 2, 2016 – campus TV interview on use of drones to map seagrass, local NBS affiliate KRIS
- March 18, 2015 – MOU signing between Conrad Blucher and USACE, local NBS affiliate KRIS
- March 2, 2015 – Inside Unmanned Systems article, “Texas A&M-Corpus Christi, AgriLife Research Approved for Drone-Based Plant Health Study”, [link to article](#)
- February 16, 2015 – Radio interview on KEDT PBS related to drone regulations
- January 30, 2015 – KORO TV local Spanish language station campus interview on drones
- April 28, 2014 - Satellite Media Tour on UAVs, Fox, TWC, NBC (18 state and national affiliates)
- Sep. 21, 2014 - Drone research featured on local TV news outlets KRIS
- Sep. 10, 2014 - TAMUCC State of the University Address video feature on Starek’s UAS research
- June 7, 2014 - Corpus Christi Caller Times front page feature article on UAVs

## UNIVERSITY SERVICE ACTIVITIES

### TAMUCC Committee Service (since 2014)

- Geospatial Computer Science Program Coordinator, 2018-Present
- GIS Program Faculty Search Committees: 4 total
- SACNAS Conference Planning and Organizing Committee: 2015, 2016, 2017, 2018, 2019, 2020
- University Scholarship Committee, College of Science and Engineering Rep., Sep. 2014 - Aug. 2016
- Honors Council, College of Science and Engineering Rep., Sep. 2014 - Aug. 2016
- Department of Computing Sciences Research Committee, Sep. 2015 - Aug. 2016
- Faculty Senate, College of Science and Engineering Rep., May 2015 – April 2017
- Council of Principal Investigators and Research Administrators (CPIRA), Faculty Senate defacto representative, May 2015 – Present

## TECHNICAL SKILLS

- **Programming:** Matlab, Python, experience in C++, ASP, JAVA, SQL
- **GIS/Civil Software:** GRASS GIS, QGIS, ArcGIS, Carlson Survey
- **Image Processing Software:** ERDAS Imagine, ENVI, Pix4D, Photoscan
- **LiDAR Software:** TerraSolid, Leica Cyclone, RiScan Pro, LASTools, QT Modeler
- **GNSS/INS Software:** Applanix POSPac, Novatel Inertial Explorer
- **Selected Training:** Pulse Aerospace Vapor 55 UAS Flight Operations Training (2017); FAA Lone Star UAS Center Flight Operations and Safety Training (2016); Riegl TLS Data Acquisition Training (2014); FAA Ground Observation Training (2014); Leica Advanced Registration with Cyclone (2011); Optech certification in ALTM data processing (2007). Short courses attended include Google Cloud ML, InSAR, and Geostatistics. Extensive Lidar, UAV, and GNSS survey experience.

## PUBLICATIONS

(\* = corresponding author)

### Book Chapters

1. Starek, M.J., Gingras, M., Jeffress, G. (accepted, in press, 2019). Application of Unmanned Aircraft Systems for Coastal Mapping and Resiliency, in *United Nations Global Geospatial Information Management for Sustainable Development Goals*, Taylor & Francis Group.
2. Starek, M.J. and Wilkinson, B., (accepted, in press, 2019) Chapter 11: Aerial Surveying Technology. *ASCE Engineering Surveying Manual*, published by ASCE.



3. Starek, M. J., Harmon, R. S., & Mitsova, H. (2016). Fort Fisher, NC Past and Present: A Geospatial Analysis using LiDAR and GIS. In *Military Geosciences and Desert Warfare – Past Lessons and Modern Challenges* (pp. 95-103). Springer, New York.
4. Starek, M. J. (2016). Airborne Laser Terrain Mapping (ALTM), pp 4-7. Light Detection and Ranging (LIDAR). pp 383-384. MJ Kennish (ed.), *Encyclopedia of Estuaries*.
5. Starek, M. J., Slatton, K. C., Shrestha, R. L., & Carter, W. E. (2009). Chapter 10: Airborne LiDAR Measurements to Quantify Change in Sandy Beaches. *Laser Scanning for the Environmental Sciences*, 147.

### Journal and Conference Papers

#### *Refereed*

1. Starek, M.J., Chu, T., Mitsova, H. and Harmon, R.S., 2020. Viewshed simulation and optimization for digital terrain modelling with terrestrial laser scanning. *International Journal of Remote Sensing*, 41(16), pp.6409-6426.
2. Culver, M., Gibeaut, J.C., Shaver, D.J., Tissot, P. and Starek, M., 2020. Using Lidar Data to Assess the Relationship Between Beach Geomorphology and Kemp's Ridley (*Lepidochelys kempii*) Nest Site Selection Along Padre Island, TX, United States. *Frontiers in Marine Science*, 7, p.214.
3. Hadimlioglu, I.A., King, S.A. and Starek, M.J., 2020. FloodSim: Flood Simulation and Visualization Framework Using Position-Based Fluids. *ISPRS International Journal of Geo-Information*, 9(3), p.163.
4. Olsen, Z., Grubbs, F., Starek, M.J., Clarkson, E. and Berryhill, J., 2020. Logistical and technical considerations for the use of unmanned aircraft systems in coastal habitat monitoring: A case study in high-resolution subaquatic vegetation assessment. *Shore & Beach*, 88(2), p.46.
5. \*Pashaei, M., Starek, M.J., Kamangir, H. and Berryhill, J., 2020. Deep Learning-Based Single Image Super-Resolution: An Investigation for Dense Scene Reconstruction with UAS Photogrammetry. *Remote Sensing*, 12(11), p.1757.
6. \*Pashaei, M., Kamangir, H., Starek, M.J. and Tissot, P., 2020. Review and evaluation of deep learning architectures for efficient land cover mapping with UAS hyper-spatial imagery: A case study over a Wetland. *Remote Sensing*, 12(6), p.959.
7. \*Nguyen, C., Starek, M.J., Tissot, P.E., Cai, X. and Gibeaut, J., 2019. Ensemble neural networks for modeling DEM error. *ISPRS International Journal of Geo-Information*, 8(10), p.444.
8. \*Garcia, I.A., Starek, M.J. and Brewer, M.J., 2019, July. Assessing VIs Calculated From UAS-Acquired Multispectral Imaging to Detect Iron Chlorosis in Grain Sorghum. In *IGARSS 2019-2019 IEEE International Geoscience and Remote Sensing Symposium* (pp. 9224-9227). IEEE.
9. Chapman, H., O'Connor, H., Starek, M. J., Kar, D. C., Chapman, H., O'Connor, H., Starek, M. J., Kar, D. C. (2019). In the Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp) (Ed.), *A Framework for Determination of Ocean Wave Properties Using Unmanned Aerial Systems* (pp. 35-39). *Proceedings of the 2019 International Conference on Scientific Computing (CSC)*.
10. \*Pashaei, M. and Starek, M.J., 2019, July. Fully Convolutional Neural Network for Land Cover Mapping In A Coastal Wetland with Hyperspatial UAS Imagery. In *IGARSS 2019-2019 IEEE International Geoscience and Remote Sensing Symposium* (pp. 6106-6109). IEEE.
11. Aydin, B., Selvi, E., Tao, J. and Starek, M.J. (2019). Use of Fire-Extinguishing Balls for a Conceptual System of Drone-Assisted Wildfire Fighting. *Drones*, 3(1), p.17.
12. Starek, M.J., Chu, T., Bridges, D. (2018). Evaluation of a Survey-Grade, Long-Range UAS Lidar System: A Case Study in South Texas, USA. In *Proceedings of IEEE International Geoscience and Remote Sensing Symposium, IGARSS 2018. July 22–27, 2018, Valencia, Spain*. 4 pp (in press).

13. \*Koskovich, B., Rhanemoonfar, M., Starek, M.J., (2018). Virtualot – A framework enabling real-time coordinate transformation and occlusion sensitive tracking using UAS products, deep learning, object detection and traditional object tracking techniques. In Proceedings of IEEE International Geoscience and Remote Sensing Symposium, IGARSS 2018. July 22–27, 2018, Valencia, Spain. 4 pp (in press).
14. \*Nguyen, C., Starek, M.J., Tissot, P. and Gibeaut, J. (2018). Unsupervised Clustering Method for Complexity Reduction of Terrestrial Lidar Data in Marshes. *Remote Sensing*, 10(1), 133; doi:10.3390/rs10010133.
15. \*Chu, T., Starek, M.J., Brewer, M.J., Murray, S.C. and Pruter, L.S., 2018. Characterizing canopy height with UAS structure-from-motion photogrammetry—results analysis of a maize field trial with respect to multiple factors. *Remote Sensing Letters*, 9(8), pp.753-762.
16. Backoulou, G.F., Elliott, N.C., Giles, K.L., Alves, T.M., Brewer, M. and Starek, M.J., 2018. Using Multispectral Imagery to Map Spatially Variable Sugarcane Aphid Infestations in Sorghum. *Southwestern Entomologist*, 43(1), pp.37-44.
17. Pugh, N., Horne, D.W., Murray, S.C., Carvalho, G., Malambo, L., Jung, J., Chang, A., Maeda, M., Popescu, S., Chu, T. and Starek, M.J., 2018. Temporal Estimates of Crop Growth in Sorghum and Maize Breeding Enabled by Unmanned Aerial Systems. *The Plant Phenome Journal*, 1(1).
18. Backoulou, G., Elliott, N., Giles, K., Brewer, M., Starek, M. J. (2018). Detecting Change in a Sorghum Field Infested by Sugarcane Aphid. *Southwestern Entomologist*, 43(4), 823-832.
19. Backoulou, G.F., Elliott, N.C., Giles, K.L., Brewer, M. and Starek, M.J. (2018). Detecting Change in a Sorghum Field Infested by Sugarcane Aphid. *Southwestern Entomologist*, 43(4), pp.823-832.
20. \*Chu, T., Starek, M.J., Brewer, M.J., Murray, S.C., Pruter, L.S. (2017). Assessing Lodging Severity over an Experimental Maize (*Zea mays* L.) Field Using UAS Images. *Remote Sensing*, 9(9), doi:10.3390/rs9090923.
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#### **Dissertation**

1. Starek, M.J., Probabilistic Methods for Improved Change Detection and Prediction on Sandy Beaches Using High Resolution Airborne LiDAR, *Ph.D Thesis, University of Florida*, 166 p, 2008.

#### **Trade Publications**

1. \*M. Schwind and M.J. Starek, "Structure-from-Motion Photogrammetry: How to Produce High-Quality 3D Point Clouds, feature article in *GIM International*, V 31 (10), October 2017.
2. M.J. Starek and J. Jung, "Lidar's Next Geospatial Frontier", feature article in *GIM International*, July 2015.
3. Jung, J., Starek, M. J., Chang, A., "LiDAR research at the Island University", in *LiDAR News*, 3rd ed., vol. 5, pp. 55-59, 2015.
4. M.J. Starek, "O'Brien Award Winners: An Interview with Richard "Skip" Davis", in *Shore and Beach*, Vol 82 (1), Winter 2014.
5. \*T. Davis and M. J. Starek, "UAS Surveying of an Island Campus", YoungGeo feature article in *GIM International*, Volume 28 (8), September 2014.
6. J. Wood and M.J. Starek, "Review: Manual of Airborne Topographic Lidar", in *PE&RS*, 2013.

#### **Selected Technical Reports**

1. M.J. Starek, J. Landivar, C. Yang, Development and Validation of a UAS-based Sensing Platform for Monitoring the Growth and Health of Cotton, Final Report for Texas State Support Committee, Cotton Inc., Project Number: 15-669TX, 29pp., January 24, 2017.
2. M.J. Starek, "High-resolution Lidar Observations of Rookery Islands in the Upper Laguna Madre to Define a Monitoring", prepared for Texas General Land Office Coastal Management Program Cycle 19 TGLO Contract # 15-050-000-8395, 79 pp., June 30, 2016.

3. M.J. Starek and H. Lee, Development of Probabilistic Clutter Maps within Complex Forested Terrain Using Airborne Lidar Data, prepared for USACE ERDC Geospatial Research Laboratory, BAA Contract W9132V-14-C-0003, 46 pp., January 31, 2016.
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## CONFERENCE ABSTRACTS AND PRESENTATIONS

### As Presenting Author or Co-Author

(\* = invited, my name in bold = oral presentation)

1. **Starek, M. J.** (Presenter), "Evaluating the Accuracy of UAS Structure-from-Motion Survey Products: Lessons Learned," Coastal Bend GIS Day, Corpus Christi, TX. (November 13, 2019).
2. **Starek, M. J.**, "UAS for Coastal and Marine Applications," University of Florida Geomatics Program, Gainesville, FL. (November 8, 2019).
3. **Starek, M. J.** (Author & Presenter), Berryhill, J. (Author), "Evaluating UAS Surveying for Monitoring of Oiling Events on Sandy Beaches," ASBPA Annual Conference, American Shore and Beach Preservation Association, Virginia Beach, VA. (October 2019).
4. **Starek, M. J.**, "Geospatial Revolution: GIS, Lasers, and Drones," Islander Days: Touch of Class, TAMUCC. (October 19, 2019).
5. **Starek, M. J.**, "UAS for Coastal Zone Monitoring of the South Texas Gulf Coast and Beyond," NOAA Hydrographic Services Review Panel (HSRP), NOAA, New Orleans, LA. (August 28, 2019).
6. **Starek, M. J.**, "Update on UAS Activities at TAMUCC," UNOLS Scientific Committee on Oceanographic Airborne Research (SCOAR), UNOLS, Northeastern University, Boston MA. (August 22, 2019).
7. **Starek, M. J.** (Author & Presenter), Pashaei, M. (Author), "Fully Convolutional Neural Network for Land Cover Mapping In A Coastal Wetland with Hyperspatial UAS Imagery," IEEE IGARSS, IEEE, Yokohama, Japan. (July 2019).
8. **Starek, M. J.** (Author & Presenter), Nguyen, C. (Author), Tissot, P. (Author), Cai, X. (Author), "Modeling DEM Error from 3D Point Clouds with Ensemble Neural Networks," 20th Annual USACE JALBTCX Airborne Coastal Mapping and Charting Workshop, USACE, Notre Dame, IN. (June 2019).
9. **Starek, M. J.** (Author & Presenter), "Monitoring Impacts of Hurricane Harvey to Natural and Built Infrastructure with Lidar and UAS-SfM," Joint: 6th International Conference on Earth Observation for Environmental Changes and the 8th International Conference on Geo-information Technologies for Natural Disaster Management, EOEC-GIT4NDM, Chengdu, China. (June 24, 2019).

10. **Starek, M. J.** (Author & Presenter), "UAS for Coastal Zone Monitoring," TGLO Academic Research Exchange, Texas General Land Office, Austin, TX. (May 3, 2019).
11. **Starek, M. J.** (Author & Presenter), Berryhill, J. (Author), "Evaluating UAS Surveying for Monitoring Oiling Events on the Texas Coast," ASBPA Texas Coastal Symposium, American Shore and Beach Preservation Association, Corpus Christi, TX. (April 16, 2019).
12. **Starek, M. J.**, "The Hyperspatial Frontier: Topographic Mapping with UAS Photogrammetry and LiDAR," TxDOT Surveyors Conference, Texas Department of Transportation, Austin, TX. (March 26, 2019).
13. **Starek, M. J.** (Author & Presenter), Chu, T. (Author), "Evaluation of UAS Lidar vs UAS SfM – A Case Study," ASPRS 2019 Annual Conference, American Society for Photogrammetry and Remote Sensing, Denver, CO. (January 30, 2019).
14. **Starek, M. J.**, "UAS for Coastal and Marine Applications," University of Florida Geomatics Program. (November 16, 2018).
15. **M.J. Starek**, Berryhill, J., Gibeaut, J., "Evaluating UAS-SfM Change Detection for Oiling Events on Sandy Beaches," American Geophysical Union Fall Meeting, Washington D.C. (December 14, 2018).
16. **M.J. Starek**, 3D Geospatial Information for Sustainable Coasts: Emerging Solutions and Applications, United Nations World Geospatial Information Congress, United Nations, Dequing, China. (November 21, 2018).
17. **M.J. Starek**, Evaluation of a Survey-Grade, Long-Range UAS Lidar System: A Case Study in South Texas USA, IEEE International Geoscience and Remote Sensing Symposium, IEEE, Valencia, Spain. (July 27, 2018).
18. **M.J. Starek**, Nguyen, C., Tissot, P., Cai, X., "Unsupervised and Deep Learning for Semantic Segmentation of Imagery and Point Cloud Data in Wetlands," 19th Annual USACE JALBTCX Airborne Coastal Mapping and Charting Workshop, USACE, Providence, RI. (June 28, 2018).
19. **M. J. Starek**, T. Chu, M. Brewer, S. Murray, UAS Surveying for Crop Development Over an Experimental Maize Field., American Society of Civil Engineers (ASCE) UESI 2018 Surveying & Geomatics Conference at California State Polytechnic University, Pomona, CA: April 22-24, 2018.
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23. **M.J. Starek**, UAS for Geoinformatics Applications, SACNAS Conference, Salt Lake City, Utah, Oct. 21, 2017.
24. **\*M.J. Starek**, Update on UAS Activities at the Lone Star UAS Test Site and TAMUCC, UNOLS Scientific Committee on Oceanographic Airborne Research (SCOAR), La Jolla, CA, August 16, 2017.
25. **M.J. Starek** and Z. Giessel, Fusion of UAS Structure-from-Motion and Optical Inversion for Seamless Topo-Bathymetric Mapping, IEEE International Geoscience and Remote Sensing Symposium, Fort Worth, Texas, July 23-28, 2017.

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32. \***M.J. Starek**, Unmanned Aircraft Systems (UAS) Equipment and Software Basics, Managing Natural Resources with UAVs Symposium, Texas A&M University-Kingsville, Sep. 16, 2016.
33. **M.J. Starek**, UAS Platforms, Software, and Sensors, Corpus Christi UAS Luncheon, Del Mar College Business Incubation, August 17, 2016.
34. **M.J. Starek** and B. Nazeri, Evaluation of Active and Passive Aerial Surveying Techniques for Submerged Structure Mapping in Shallow Coastal Water, USACE JALBTCX 17th Annual Coastal Mapping and Charting Workshop, Silver Springs, MD, July 2016.
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36. **M.J. Starek**, S. Lyle, J. Garrett, J. Berryhill, UAS Land Survey Data Model and Workflow Evaluation for Oil and Gas Industry, Texas UAS Summit, Austin, TX, March 29-31, 2016.
37. M.J. Starek (poster) and J. Giessel, Investigation of UAS-based SfM Photogrammetry and Bathymetric Inversion for Mapping a Shallow Water, Low-energy Littoral Zone, AGU Ocean Sciences, New Orleans, Feb. 2016.
38. \***M.J. Starek** and J. Berryhill, Review of UAS Technology for Photogrammetry and Remote Sensing Applications in Resource Monitoring, Society of Range Management 69<sup>th</sup> Annual Conference, Corpus Christi TX, Feb. 2016
39. **M.J. Starek**, 3D Mapping with UAS-based SfM Photogrammetry, 17th Annual Coastal Bend GIS Day, Corpus Christi, TX, November 17, 2015.
40. **M.J. Starek**, Aerial Mapping of Coastlines with Lasers and Drones, SACNAS Conference, National Harbor, MD Oct. 31, 2015.
41. \***M.J. Starek** and S. Lyle, LSDM Workflow & Analysis of Topographic Surface Using Different UAS Solutions, Association of Petroleum Surveying and Geomatics (APSG) Annual Conference, Houston TX, Oct. 29, 2015.
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43. **M.J. Starek** and Z. Giessel, 2D and 3D Mapping of a Littoral Zone with UAS SfM Photogrammetry, Texas Beach and Dune Workshop, Harte Research Institute, Corpus Christi, TX, Sep. 24-25, 2015.
44. \***M.J. Starek**, UAS and GIS, Regional Compstat Meeting for Policing, hosted by TAMU-CC Police department, August 20, 2015.
45. Heezin Lee, **M. J. Starek**, S. B. Blundell, C. Gard and H. Puffenberger, Probabilistic clutter maps of forested terrain from airborne LiDAR point clouds, in Geoscience and Remote Sensing Symposium (IGARSS), IEEE International, Milan, Italy, July 26-31, 2015.
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51. **M.J. Starek**, Technology on the Horizon: Unmanned Aircraft Systems & How They'll Shape Surveying, 16th Annual Coastal Bend GIS Day, Corpus Christi, TX, November 19, 2014.
52. **M.J. Starek** and D. Bridges, Unmanned Aircraft Systems for Coastal Mapping Applications, American Shore and Beach Preservation Association Conference, Virginia Beach, Oct. 14-17, 2014.
53. **M.J. Starek**, UAS Coastal Mapping Activities on an Island Campus, USACE JALBTCX 15th Annual Coastal Mapping and Charting Workshop, Mobile AL, June 10-12, 2014.
54. \***M.J. Starek**, Update on UAS Coastal Activities at the Lone Star UAS Test Site, UNOLS Scientific Committee on Oceanographic Airborne Research (SCOAR), San Diego CA, June 4-5, 2014.
55. M.J. Starek (poster), J.C. Fernandez, et. al., Discrete Return and Full Waveform Bathymetric Lidar Mapping of Redfish Bay TX, Texas Bays & Estuaries Meeting., Port Aransas TX, April 23-24, 2014.
56. **M.J. Starek**, D. Bridges, J. Gibeaut, and P. Tissot, Unmanned Aerial System for Coastal Reconnaissance of the Near-shore Zone, ASPRS Annual Conference, Louisville, KY, March 23-28, 2014.
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58. **M.J. Starek**, J. Gibeaut, and D. Del Angel, Mining Patterns in Post-Ike Volumetric Recovery Along the Upper Texas Coast, ASBPA National Conference, South Padre Island TX, Oct. 22-24, 2013.
59. **M.J. Starek**, et al., Bathymetric Lidar for Benthic Mapping in a Shallow Bay, USACE JALBTCX 14th Annual Coastal Mapping and Charting Workshop, Mobile AL, August 6-7, 2013.
60. \***M.J. Starek**, Fernandez-Diaz, J.C., Singhania, A., Shrestha, R.L., Gibeaut, J.C., Su, L., Reisinger, A.S. and Lord, A., 2013, Bathymetric Lidar Mapping of Seagrass Distribution within Redfish Bay State Scientific Area, Texas. AGU Meeting of Americas, Cancun, Mexico, May 14-17, 2013.



61. **M. J. Starek**, J.G. Gibeaut, D. Angel, Multitemporal Lidar Assessment of Hurricane Ike Impact and Recovery along the Upper Texas Coast, National Conference on Beach Preservation Technology, Jacksonville, FL, February 13-15, 2013.
62. H. Lee, S. Bruce Blundell, M. J. Starek (poster), and J. G. Harris, Modeling Line-of-Sight Visibility Below the Canopy with Airborne Lidar Point Cloud Data, in Proceedings of MAPPS/ASPRS Specialty Conference, Tampa FL, October 29-Nov. 1, 2012.
63. **M.J. Starek**, H. Mitsova, K. Wegmann, and N. Lyons, Spatiotemporal Representation of Stream Bank Evolution Mapped by Terrestrial Laser Scanning, AGU Fall Meet., San Francisco, CA, December 9-13, 2012.
64. **M.J. Starek**, H. Mitsova, E. Hardin, B. Blundell, and J.G. Gibeaut, Space-Time Cube Visualization of Landscape Dynamics with Lidar Time Series Data, USACE JALBTCX 13th Annual Coastal Mapping and Charting Workshop, Chicago, June 20-22, 2012.
65. M.J. Starek (poster), H. Mitsova, and K. Wegman, Terrestrial Laser Scanning for Measuring Stream Bank Erosion within Legacy Sediments: Data Processing and Analysis Methods, AGU Fall Meet., San Francisco, CA, Dec. 5-9, 2011.
66. M.J. Starek (poster), H. Mitsova, and R.S. Harmon, Optimization of Terrestrial Laser Scanning Survey Design for Dynamic Terrain Monitoring, Abstract G21A-0796 presented at AGU Fall Meet. San Francisco, CA, Dec. 13-17, 2010.
67. \***M.J. Starek**, H. Mitsova, and R.S. Harmon, Information Extraction Methods for Coastal Terrain Monitoring with Lidar Time Series, USACE JALBTCX 11th Annual Coastal Mapping and Charting Workshop, Mobile, AL, May 25-28, 2010.
68. \***M.J. Starek**, "Pattern Classification Methods for Coastal Terrain Monitoring with Lidar Time Series", US Army Research Office and USACE Coastal LiDAR Workshop, Duck NC, April 1-2, 2010.
69. M.J. Starek (poster) and H. Mitsova, High Resolution Monitoring of Storm-Induced Terrain Change in an Experimental Watershed with Lidar, Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract G23A-0658, Dec. 14-18, 2009.
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(\* = invited, underlined name = my student as presenter)

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