

Y. T. Jade Morton

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- Tsui, J. B. Y., *Global Positioning System Receivers, A Software Approach*, 2<sup>nd</sup> edition, Wiley & Sons, 2004.

Proposal Review: NSF, AFOSR, AFRL, NASA

Tutorials and Short Courses Offered to Universities, Industries, and Government Agencies:

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- Co-host and organizer, STEM First Abilities outreach to high school female students, *2011-12* 2bi3

- 5<sup>th</sup> place Design Award, Intelligent Ground Vehicle Competition,

8. *Bo Han*, GNSS Radio Occultation for Atmospheric Profiling, Visiting PhD student from Nanyang Technological University, Singapore, 2017
9. *Chen Wang*, Study on GNSS-Based Ionospheric Model, Applications, and Service System, Tongji University, China, joint advi9 (o)21.7 (f)6.91 Tf6.826 0 Td{ ) 0 Td{ ) 0TJ/0 Td( )Tj-2837 (



Carolyn Roesler, 2019-Present.

- 19. PI: LADAR EO GPS/INS Atomic Clock Navigation Demonstration and Worldwide Accurate Sensor Positioning System technical support. *\$120K. 2007-8.*
- 20. PI: An integrated spatial digital beam forming and adaptive periodogram technique for interference and jamming cancellation. *\$15K. 2006.*
- 21. PI: Integrated navigation reference systems for micro-UAV information applications. *\$65K. 2005-6.*
- 22. PI: Algorithm development for GPS interference cancellation. *\$10K. 2002.*

Air Force Asian Office of Aerospace Research and Development (AOARD):

- 23. Co-PI: Determination of precise satellite orbital position using multi-band GNSS signals. *\$100K. 2015-17.*

Army:

- 24. PI: Networked PNT solution (PNT-Net) for GPS-denied navigation, Phase I, *\$40K* subcontract from QuNav, 2020.

DARPA:

- 25. Co-PI: HEARTBEAT – Heliosphere to Earth Atmosphere Rendering Through Building Excellent Artificial-intelligence Training. *\$853,413. 2019-21.*

Dayton Area Graduate Studies Institute:

- 26. PI: Multi-domain analysis of GNSS signals. *\$43.5K. 2013-14.*
- 27. PI: Space weather effects on GNSS. *\$43.5K. 2013-14.*
- 28. Co-PI: Physics-based modeling of sensor environment.

NOAA:

37. PI: Low elevation multi-GNSS signal processing for remote sensing. \$532K. 2021-22.

NSF:

38. PI: MRI - Acquisition of multi-constellation GNSS data collection arrays for low latitude ionospheric effects studies. \$253K. 2014-17.

39. Co-PI: A study on the circulation and structure of metallic ions in the mid-latitude ionosphere. \$342K. 2007-12.

40. Co-PI: Dual-beam incoherent scatter radar study of the mesosphere. \$210K. 2003-6.

Office of Naval Research (ONR):

41. Co-PI: STTR – Novel Nanosat Payloads for Naval Weather Needs. Subcontract from ASTRO. Phase I, \$45K. 2017-18. Phase II, \$365K, 2019-21.

Private Industries

42. PI: GNSS Skydel software and simulation tool, in-kind donation, Orolia, \$293K. 2020.

43. PI: GPS Signal monitoring via machine learning, Lockheed Martin, \$100K. 2019-20.

44. PI: Septentrio, Corporate Gift Fund, \$13K. 2020.

45. PI: Consortium of Ohio Universities on Navigation and Timekeeping (COUNT) industrial affiliates. \$248K. 2007-Present.

46. PI: Honeywell, Ionosphere error research for Ground-Based Augmentation Systems (GBAS). Corporate Gift Fund, \$35K. 2016-17.

47. PI: Equipment donations from Freewave Technologies, John Deere/NavCom, Novetal, NPC, Snapper, Symmetricom (now Microsemi), Topcon, and Trimble Navigation. ~\$400K. 2004 - Present.

SELECTED invited PRESENTATIONS:

1. NOAA: Low elevation multi-GNSS signal processing for remote sensing applications, June 2021.
2. JPL: A leap of phase – recent progress in high precision GNSS-R development and applications, May 2021.
3. Chinese Satellite Navigation Conference: GNSS as signals-of-opportunity for remote sensing of ionosphere, troposphere, and Earth surface, May 2021.
4. Space Weather Workshop: Ionosphere impact on GNSS, Jan. 2021.
5. Institute of Navigation Webinar: Automatic detection of ionospheric scintillation-like GNSS

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15. Stanford PNT Symposium: Synergy between Satellite Navigation and Remote Sensing, Palo Alto, CA, October 2019.
16. NASA Living With A Star Institute: Ionospheric Effects, Impacts, and Mitigation, Jackson, WY, October 2019.
17. Tsinghua University: "Position, Navigation, and Timing Technologies in the 21<sup>st</sup> Century: Update on the New PNT Books," Beijing, China, May 2019.
18. Workshop on Ionospheric Forecasting for GNSS Operations in Developing Countries - Findings and Challenges: GNSS for ionosphere and scintillation monitoring, Trieste, Italy, May 2019.
19. University of Michigan: Satellite Navigation and Sensing – A Match Made in Heaven, Ann Arbor, MI, March 2019.
20. Nanyang Technological University: Advanced GNSS Receiver Technologies for Radio

42. ION Southern California Section: Multi-GNSS for Distributed Atmospheric Remote Sensing. Los Angeles, CA. November 2015.
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68. Coupling, Energetics, and Dynamics of Atmospheric Regions Workshop: Time-Frequency Analysis of GPS Scintillations at HAARP. Santa Fe, NM, June, 2012.
69. New GNSS Algorithms and Techniques for Earth Observations Workshop: How GNSS Signal Processing Alters Signal Parameters: A Cautionary Tale in Using GNSS for Remote Sensing Applications. Hong Kong, May 2012.
70. Ionosphere Interactions Workshop: Capturing GNSS Scintillations at HAARP. Santa Fe, NM, April 2012.
71. Nanyang Technological University: GNSS Ionospheric Scintillation. Singapore, March 2012.
72. Hong Kong Polytechnic University: GNSS Research. Hong Kong, January 2012.
73. ION North Star Section: Ionosphere Effects and GNSS and RF Navigation Research. Nov. 2011.
74. CEDAR Workshop: Multiband GNSS Scintillation. Santa Fe, NM, June 2011.
75. AFOSR Program Review: Ionosphere Scintillation Effects on GNSS Receivers. Eglin AFB, June 2011.
76. Chinese Satellite Navigation Conference: GNSS Receivers for Ionosphere Scintillation Studies. Shanghai, China, May 2011.
77. Miami University Farmer Business School: Chinese Science and Technology - History, Recent Development, and Future Outlook. Oxford, OH, Feb. 2011.
78. AFOSR Singapore PNT Workshop: Ionosphere Effects. Honolulu, Hawaii, Dec. 2010.
79. Washington University, Electrical and Systems Engineering Department: A GPS Multipath Estimation and Mitigation Technique for High Accuracy Applications. St. Louis, MO, Oct. 2010.
80. AFRL, Next Generation Radar Workshop: Overview of Miami University Current Radar and Navigation Research Efforts. Dayton, OH, Aug. 2010.
81. CEDAR Workshop: GPS Receivers Measurements of L-Band Ionosphere Scintillations at HAARP, Alaska. Boulder, CO, June 2010.
82. AFOSR Program Review: GPS Multipath Detection, Estimation, and Mitigation Using Multi-Channel Software Receivers. Waltham, MA, June 2010.
83. International Antarctic Science Workshop: Arctic GPS. Albany, NY, May 2010.
84. Virginia Tech: Ionosphere Effect on GPS Measurements and GPS Receiver Algorithms for High Accuracy Applications. Blacksburg, VA, Dec. 2009.
85. Miami University Sigma Xi Researcher of the Year Presentation: The Global Positioning System - Past, Present, and Future. Oxford, OH, Sep. 2009.
86. Johns Hopkins University Applied Physics Research Laboratory: Higher Order Ionosphere Error in GPS Measurements. Laurel, MD, Aug. 2009.
87. University of Calgary: GPS Self-Interference and Mitigation. Calgary, Canada, Jun. 2009.
88. Istituto Superiore Mario Boella: Recent Position, Location, and Navigation Research Activities at Miami University. Torino, Italy, Apr. 2009.
89. Miami University SEAS 50th Anniversary: Position, Location, and Navigation – Anywhere, Anytime. Oxford, OH, Apr. 2009.
90. Stanford University, GPS Lab: Navigation Research at Miami. Palo Alto, CA, May 2008.
91. NAVAIR: Second Order Ionosphere Error Assessment and Low Power Short Delay Multipath Detection. Paxton River, MD, May 2008.
92. ION Dayton Section, Dayton:



- J14. Yang, Z., Y. Morton, I. Zakharenkova, I. Cherniak, S. Song, W. Li, "Global view of ionospheric disturbances impacts on kinematic GPS positioning solutions during the 2015 St. Patrick's Day storm," *J. Geophys. Res., Space Sci.*, DOI: 10.1029/2019JA027681, 2020.
- J15. Han, B., Y. Morton, E. Gunawan, D. Xu, "Planetary boundary layer height detection using mountain-based radio occultation signal amplitude," *IEEE Trans. Geosci. Remote Sensing*, 57(7), 4332-4348, DOI: 10.1109/TGRS.2018.2890676, 2019.
- J16. Liu, Y., I. Collett, Y. Morton, "Application of neural network to GNSS-R wind speed retrieval," *IEEE Trans. Geosci. Remote Sensing*, 57(12), 9756-9766, DOI:10.1109/TGRS.2019.2929002, 2019.
- J17. Liu, Z., Z. Yang, D. Xu, Y. J. Morton "On inconsistent ROTI derived from multi-constellation GNSS measurements of globally distributed GNSS receivers for characterizing ionospheric irregularities," *Radio Sci.*, 10.1029/2018RS006596, 2019.
- J18. Rino, C., Y. Morton, B. Breitsch, C. Carrano, "Stochastic TEC structure characterization," *J. Geophys. Res., Space Phy.*, <https://doi.org/10.1029/2019JA026958>, 2019.
- J19. Wang, J., Y. Morton, "A hybrid correlation model for the space-receiver technique," *Radio Sci.*, 54(3), 281-297, <https://doi.org/10.1029/2018RS006662>, 2019.
- J20. Yang, R., D. Xu, Y. Morton, "Generalized multi-frequency GPS carrier tracking architecture: design and performance analysis
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- J69. Morton, Y., M. Miller, J. Tsui, D. Lin, Q. Zhou, "GPS civil signal self-interference mitigation during weak signal acquisition," *IEEE Trans. Signal Processing*, 55(12), 5859-5893, 2007.
- J70. Zhou, Q., Y. Morton, "Gravity wave propagation in a non-isothermal atmosphere with height varying background wind," *Geophys. Res. Lett.*, 34, L23803, doi:10.1029/2007GL031061, 2007.
- J71. Zhou, Q., Y. Morton, "A case study of mesospheric gravity wave momentum flux and dynamical



- C22. Yang, Z., S. Mrak, Y. Morton, "Geomagnetic storm induced mid-latitude ionospheric plasma irregularities and their implications for GPS positioning over North America: a case study," *Proc. IEEE/ION PLANS meeting*, Virtual, 2020.
- C23. Breitsch, B., Y. Morton, D. Xu, R. Yang, "Ionosphere scintillation-induced phase transitions in triple-frequency GPS measurements," *Proc. ION ITM/PTTI*, San Diego, CA, 2020.
- C24. Chen, X., Y. Morton,

- C43. Wang, J., Y. Morton, "A hybrid correlation method from the anisotropy model and the front velocity model for ionospheric irregularity drift velocity estimation using GNSS spaced-receiver array," Proc. ION GNSS+, Miami, FL, Sept. 2018.
- C44. Yang, R., Y. Morton, "Hybrid carrier tracking and position determination using low elevation satellite signals," Proc. ION GNSS+, Miami, FL, Sept. 2018.
- C45. Wang, Y., Y. Morton, R. Yang, F. van Graas, J. Hasse, "Robust closed-loop tracking of airborne low-elevation GPS radio-occultation signals," Proc. ION GNSS+, Miami, FL, Sept. 2018.
- C46. Xu, D., Y. Morton, Y. Jiao, R. Yang, "Implementation and p(r)6.9 (a)9.2 8nd veNv.6 (e)9.ugnals,oNSS+ignalskin







*C104. Jiao, Y., Y. Morton, S. Taylor*

- C125. Di, R., Y. Morton, S. Peng, "A USRP-based GNSS and interference signal generator and playback system," *Proc. IEEE PLANS*, Myrtle Beach, SC, April 2012.
- C126. Peng, S., Y. Morton, R. Di, "A multiple-frequency GPS software receiver design based on a vector tracking loop," *Proc. IEEE PLANS*, Myrtle Beach, SC, April 2012.
- C127. Wang, J., Y. Morton, Q. Zhou, F. van Graas, W. Pelgrum, "Time-frequency analysis of ionosphere scintillation observed by a GNSS receiver array," *Proc. IEEE PLANS*, Myrtle Beach, SC, Apr. 2012. (*Best Paper in Track*)
- C128. Niu, F., Y. Morton, J. Wang, W. Pelgrum, "GPS carrier phase detrending methods and performances for ionosphere scintillation studies," *Proc. ION ITM*, Newport Beach, CA, Feb. 2012.
- C129. Park, J., D. Grejner-Brezinska, R. von Frese, Y. Morton, L. Gaya-Pique, "On using traveling ionospheric disturbances to detect underground nuclear tests," *Proc. ION ITM*, Newport Beach, CA, Feb. 2012.
- C130. Taylor, S., Y. Morton, Y. Jiao, J. Triplett, W. Pelgrum, "An improved ionosphere scintillation event detection and automatic trigger for a GNSS data collection system," *Proc. ION ITM*, Newport Beach, CA, Feb. 2012.
- C131. Jameson, B., D. Garmatyuk, Y. Morton, A. Curtis, "Target scene reconstruction in indoor environment with cognitive OFDM radar," *Proc. Int. Waveform Diversity & Design Conf.*, Kauai, HI, Jan. 2012. (*Second Place Student Paper Competition*)
- C132. Peng, S., Y. Morton, W. Pelgrum, F. van Graas, "High latitude ionosphere scintillations at L5 band," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C133. Wolfarth, R., S. Taylor, A. Wibowo, B. Williams, Y. Morton, P. Jamieson, "Redblade: Miami University's multi-functional autonomous robot," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C134. Zhang, L., Y. Morton, "GPS carrier phase and carrier phase spectrum estimation for ionosphere scintillation studies," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C135. Pelgrum, W., Y. Morton, F. van Graas, P. Vikram, S. Peng, "Multi-domain analysis of the impact on natural and man-made ionosphere scintillations on GNSS signal propagation," *Proc. ION GNSS*, Portland, OR, Sept. 2011. (*Best Presentation Award*)
- C136. Vikram, P., Y. Morton, W. Pelgrum, "Event driven data collection system for studying ionosphere scintillation," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C137. Wang, J., J. Morell, Y. Morton, "Predicting GLONASS satellite orbit based on an almanac conversion algorithm for controlled ionosphere scintillation experiment planning," *Proc. ION GNSS*, Portland, OR, Sept. 2011.
- C138. Curtis, A., D. Garmatyuk, Y. Morton, R. Ewing, "Improved target detection through OFDM radar signal's frequency analysis," *Proc. NAECOM*, Dayton, OH, July 2011.
- C139. Kauffman, K., J. Raquet, Y. Morton, D. Garmatyuk, "Enhanced feature detection and tracking algorithm for UWB-OFDM SAR navigation," *Proc. NAECOM*, Dayton, OH, July 2011. (*Best Paper Award*)
- C140. Jameson, B., A. Curtis, D. Garmatyuk, Y. Morton, P. Plummer, K. Thompson, "Detection of behind-the-wall targets with adaptive UWB AwarptiC138. B AwarptiC13tDarpt(i)-4.6 (t).9 (.6 (a)94.6 (M) -. N

- C144. Pelgrum, W., Y. Morton, F. van Graas, S. Gunawardena<sup>1</sup>, M. Bakich, D. Charney, S. Peng, J. Triplett, A. Vermuru, P. Vikram, "Measurement and analysis of artificially-generated and natural ionosphere scintillations effects on GNSS signals," *Proc. ION ITM*, San Diego, Jan. 2011.
- C145. Brenneman, M., Y. Morton, "An efficient algorithm for short delay time multipath estimation and mitigation," *Proc. ION GNSS*, Portland, OR, Sept. 2010.
- C146. Kauffman, K., J. Raquet, Y. Morton, D. Garmatyuk, "Simulation study of UWB-OFDM SAR for navigation using an Extended Kalman Filter," *Proc. ION GNSS*, Portland, OR, Sept. 2010.
- C147. Zhang, L., Y. Morton, "A variable gain adaptive Kalman filter-based carrier tracking algorithm for tracking under ionosphere scintillation," *Proc. ION GNSS*, Portland, OR, Sept. 2010.
- C148. Mao, X., Y. Morton, L. Zhang, Y. Kou, "GPS signal carrier parameters estimation using PLL with dynamic reductions," *Proc. ION GNSS*, Portland, OR, Sept. 2010.
- C149. Zhang, L., Y. Morton, Q. Zhou, F. van Graas, and T. Beach, "Characterization of GNSS signal parameters under ionosphere scintillation conditions using sequential and batch-based tracking algorithms," *Proc. IEEE PLANS*, Palm Springs, CA, May 2010.
- C150. Kou, Y., X. Zhou, Y. Morton, D. Akos, "A software-based receiver sampling frequency calibration technique and its application in GPS signal quality monitoring," *Proc. IEEE PLANS*, Palm Springs, CA, May 2010.
- C151. Kou, Y., X. Zhou, Y. Morton, L. Zhang, "Processing L2C signals under ionospheric scintillations," *Proc. IEEE PLANS*, Palm Springs, CA, May 2010.
- C152. Li, W., H. Wu, D. Ucci, Y. Morton, "A positioning system using Chinese digital TV signals under limited GPS signal observability conditions in urban environment," *Proc. ION ITM*, San Diego, CA, Jan. 2010.
- C153. Kauffman, K., Y. Morton, J. Raquet, D. Garmatyuk, "Simulation study of UWB-OFDM SAR for dead-reckoning navigation," *Proc. ION ITM*, San Diego, CA, Jan. 2010.
- C154. Morton, Y., R. Moore, F. van Graas, "GPS signal propagation mode impact on receiver position errors," *Proc. ION ITM*, San Diego, CA, Jan. 2010.
- C155. Brenneman, M., Y. Morton, "A novel maximum likelihood estimator for GPS signal angle of arrival," *Proc. Asilomar Conf. Signals, Systems, & Computers*, Pacific Grove, CA., Nov. 2009.
- C156. Kauffman, K., D. Garmatyuk, Y. Morton, "Efficient sparse target tracking algorithm for navigation with UWB-OFDM radar sensors," *Proc. NAECOM*,



- C185. Liou, L., J. Tsui, D. Lin, J. Schamus, F. van Graas, Y. Morton, "Passive altimeter study using GPS flight data," *Proc. ION GPS*, Portland, OR, Sep. 2003.
- C186. Martin, J., Y. Morton, Q. Zhou, "Neural network development for the forecasting of upper atmosphere parameters distributions," *Proc. 34th COSPAR Sci. Ass.*, Houston, TX, Oct. 2002.
- C187. Lin, D., J. Tsui, L. Liou, Y. Morton, "Sensitivity analysis of a stand alone GPS software GPS receiver and an acquisition method," *Proc. ION GPS*, Portland, OR, Sep. 2002.
- C188. Mathews, J., Y. Morton, "Radar measurements of dynamics and layering processes in the 80-

B2. Morton, Y. (in F. van Diggelen, J. J. Spilker, B. Parkinson, Position Navigation and Timing Technologies in the 21<sup>st</sup> Century, Volume 2 – Alternative Navigation, Wiley-IEEE Press, 2020.

Book Chapters:

BC1. Parkinson, B., Y. Morton, F. van Diggelen, J. J. Spilker, Chapter 1: Introduction (in F. van Diggelen, J. J. Spilker, B. Parkinson, Position Navigation and Timing Technologies in the 21<sup>st</sup> Century, Volume 2 – Alternative Navigation, Wiley-IEEE Press, 2020.