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EDUCATION AND TRAINING

PhD. [Sep 2018 – Jul 2021]

State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing (LIESMARS), Wuhan University, Wuhan- (China)

Address: <http://www.lmars.whu.edu.cn/en/>

Field of study: Photogrammetry and remote sensing

Thesis: Error Analysis and Data Merging of Multi-Source Satellite Signal-Based Soil Moisture Retrievals

M.Sc. [Oct 2012 – Jan 2016]

Faculty of Engineering, Al-Azhar University, Cairo, Egypt.

Field of study: Mining surveying

Thesis: Applications of GIS in Operations of Open Cast Mining

B.Sc. [Sep 2005 – Jul 2010]

Faculty of Engineering, Al-Azhar University, 11751 Cairo, Egypt.

Field(s) of study: Mining and Metallurgical Engineering

Thesis: Energy Resources and Energy Technologies in Egypt

Internship "the training and courses of geospatial technology and industry". [Jun 2019]

HI-TARGET surveying instrument Company, Guangzhou (China)

WORK EXPERIENCE

Lecturer [Jul 2021 – Current]

Faculty of Engineering, Al-Azhar University, Cairo, Egypt.

Assistant lecturer [Jul 2016 – Aug 2018]

Faculty of Engineering, Al-Azhar University, Cairo, Egypt.

University teaching assistant [Apr 2012 – Jul 2016]

Faculty of Engineering, Al-Azhar University, Cairo, Egypt.

Experience in teaching the following courses:

- Plane and topographic surveying.
- Geodesy surveying.
- Mining surveying.
- Geographic Information Science (GIS).
- Photogrammetry and Remote Sensing.

RESEARCH INTERESTS

GIS, Remote sensing, and Photogrammetry

Remote sensing of soil moisture:

- Validation and error analysis of satellite observations.
- Innovative techniques for satellite data merging.
- Multivariate spatiotemporal statistics.
- Data assimilation.

Innovative methods for exploiting satellite observations in hydrological applications:

(soil moisture, rainfall, river discharge → flood, landslide, drought, water resources management, agriculture).

Geospatial information technology in mining engineering.

PROJECTS

2018-2021: Quality evaluation and improvement of multi-source remotely sensed soil moisture retrieval data Project.

2018-2021: Remote sensing data assimilation into land surface models.

2012-2016: GIS in operations of open cast mining.

2016, 2021: Surveying projects in Al phosphate mines at Red sea governorate, Egypt (supervision).

2012-2015: Surveying projects in El-baharyia iron ore mines, Egypt (supervisor engineer).

2009-2010: Energy sources and Energy Technologies in Egypt (Graduation project of B.Sc.).

PUBLICATIONS

[1] Tariq, A.; Shu, H.; Saddiqui, S.; Mousa, B.G.; Munir, I.; Nasri, A.; Waqas, H.; Baqa, M.F.; Lu, L. Forest fire Monitoring using spatial-statistical and Geo-spatial analysis of factors determining Forest fire in Margalla Hills, Islamabad, Pakistan. *Geomatics, Nat. Hazards Risk* 2021, 10, doi:10.1080/19475705.2021.1920477. (SCI).

[2] Freeshah, M.; Zhang, X.; Şentürk, E.; Adil, M.A.; Mousa, B.G.; Tariq, A.; Ren, X.; Refaat, M. Analysis of Atmospheric and Ionospheric Variations Due to Impacts of Super Typhoon Mangkhut (1822) in the Northwest Pacific Ocean. *Remote Sens.* 2021, 13, 661, doi:10.3390/rs13040661. (SCI).

[3] Mousa, B.G.; Shu, H. A. A New Framework for Merging Active and Passive Remotely Sensed Soil Moisture Retrievals Based on Triple Collocation Analysis. 2020 *International Graduate Workshop on Geo-Informatics*, LIESMARS, Wuhan University. (Conference).

[4] Mousa, B.G.; Shu, H.; Freeshah, M. Validation and Error Analysis of SMOS, SMAP, and ASCAT Satellite Soil Moisture Products Over Africa by Integrating Assessment Techniques. *2nd LIESMARS Open Day*. 21 Nov, 2020, LIESMARS, Wuhan University. (Conference).

[5] Mousa, B.G.; Shu, H.; Freeshah, M.; Tariq, A. A Novel Scheme for Merging Active and Passive Satellite Soil Moisture Retrievals Based on Maximizing the Signal to Noise Ratio. *Remote Sens.* 2020, 12, 3804, doi:10.3390/rs12223804. (SCI).

[6] Yao, H.; Shu, H.; Sun, H.; Mousa, B.G.; Jiao, Z.; Suo, Y. An integrity monitoring algorithm for WiFi/PDR/smartphone-integrated indoor positioning system based on unscented Kalman filter. *EURASIP J. Wirel. Commun. Netw.* 2020, 2020, 246, doi:10.1186/s13638-020-01809-y. (SCI).

[7] Li, Y.; Shu, H.; Mousa, B.G.; Jiao, Z. Novel soil moisture estimates combining the ensemble Kalman filter data assimilation and the method of breeding growing modes. *Remote Sens.* 2020, 12, doi:10.3390/rs12050889. (SCI).

- [8] Mousa, B.G.; Shu, H. Spatial Evaluation and Assimilation of SMAP, SMOS, and ASCAT Satellite Soil Moisture Products Over Africa Using Statistical Techniques. *Earth Sp. Sci.* 2020, 7, 1–16, doi: 10.1029/2019EA000841. (SCI).
- [9] Mousa, B.G.; Embaby, A.E. Evaluation of Extracted Ores from Stopping Faces of Blocks of El-Gedida Area by Using GIS Technology. *International Research Journal of Engineering and Technology.* 2016, 3(10), 6-15.
- [10] Mousa, B.G.; Embaby, A.E; Osman, M.E. Applications of GIS in Operations of Open Cast Mining; *LAP Lambert Academic publishing.* 2016, Germany, ISBN 3659882410. (Book).
- [11] Mousa, B.G.; Embaby, A. Kh.; Osman, M.E. Processing of El-Gedida Iron Ore by using GIS to satisfy the Requirements of Blast Furnace in Egypt. *Regional Conference on Surveying & Development*, 3-6 October. 2015, Sharm El-Sheikh, Egypt.(conference).
- [12] Mousa, B.G.; Embaby, A.K.; Osman, M.E. GIS Technology for El-Gedida Iron Ore to satisfy the Requirements of Egyptian Blast Furnace. *International Journal of Scientific & Engineering Research.* 2015, 6(9), 8–14.
- [13] Mousa, B.G.; Embaby, A. Kh.; Osman, M.E. Creating Data Base for Um Salamah-El Sibaiyyah- East Nile Valley Phosphate Ore by using Geographic Information System to Assist in Mining Process Management. *Al-Azhar University Engineering Journal.* 2014, 9(1): 1548-1556.

HONOURS AND AWARDS

2021: The appreciation certificate due to obtaining Ph.D. degree with a honor degree in Photogrammetry and remote sensing under the title serve the engineering industry

Egyptian Engineering Association.

2021: The appreciation certificate due to contribution to the field of scientific research.

Faculty of Engineering, Al-Azhar University.

2020: Star lake publication award for publishing SCI papers, moreover my paper was selected as first one among five papers were chosen for 2020 five-star lake publication award

LIESMARS/Wuhan University.

2020: The appreciation certificate due to excellence participate as a volunteer member of "English Geoscience Café (EGSC)

LIESMARS, Wuhan University, China.

2019: The Wuhan University outstanding international student's scholarship in the year 2019 for the academic achievements.

Wuhan University.

2019: Star lake publication award for publishing SCI papers during Ph.D. study

LIESMARS/Wuhan University.

2016: The Excellence Shield and appreciation certificate due to obtaining a master degree with an honor degree under the topic serve the industry

Egyptian Engineering Association.

2010: The appreciation certificate due to outstanding among all graduates in the B.Sc stage

Egyptian Engineering Association.

2005-2010: The appreciation certificates due to outstanding among all students in all levels of bachelor's degree

Faculty of Engineering, Al-Azhar University, Egypt.

LANGUAGE SKILLS

Arabic: Native language.

English: Excellent (TOEFL proficiency with a total score of 580)

Chinese: Beginner user

SOFTWARES AND INSTRUMENTS SKILLS

Geographical Information System (ArcGIS).

Remote sensing (ENVI, ERDAS Image).

Programming (Matlab, Python).

Microsoft Office (Excel PowerPoint Word) - advanced level.

Adept knowledge in data analysis and graphing software OriginPro.

Statistics Software (Minitab).

Good Knowledge of Edraw.

Panoply.

Basics knowledge of working in AutoCAD.

Golden Software Surfer Advanced User.

Google Earth.

Professional user for level, total station, and theodolite instruments.

Familiar with GPS, and GNSS instruments and their softwares.

PERSONAL CHARACTERISTICS:

Ability to work in a team, quick learning, work under pressure, and ability to the lead team. Sense of humor, loyal, Responsible, Ambitious, Flexible, Tolerant, Good Listener, Precise, and Quality Driven.