Alamin Molla, M.Sc.

Arizona State University || School of Geographical Sciences & Urban Planning

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Google Scholar, ResearchGate, LinkedIn, GitHub

EDUCATION

Arizona State University Tempe, AZ – 85281	**Ph.D. Geographic Information Science**	Spring 2027 (expected)
George Mason University Fairfax, VA-22030	**M.S. Geoinformatics & Geospatial Intelligence**	Spring 2023
Auburn University Auburn, AL-36849	**M.S. Geography**	Spring 2000
Khulna University Khulna-9208, Bangladesh	**Bachelor of Urban and Rural Planning**	December 2015

RESEARCH INTERESTS

As an urban scientist, I tackle contemporary urban challenges using advanced spatial data science and remote sensing technologies. My work is dedicated to driving meaningful social impact.

Physical Urban Science: Urban Heat Island (UHI), Air Quality.

Spatial Data Science: GIScience, GeoAI, Spatial Statistics, Machine Learning.

Remote Sensing: Landsat, SAR, LiDAR, UAV.

Social Dimension: Environmental Justice, Public Health.

PUBLICATIONS

PEER-REVIEWED ARTICLES

3. Guo, L., Di, L., Zhang, C., Lin, L., Chen, F., & Molla, A., (2022). Evaluating contributions of urbanization and global climate change to urban land surface temperature change: A case study in Lagos, Nigeria. Scientific Reports, 12(1), 14168. https://doi.org/10.1038/s41598-022-18193-w
2. Molla, A., Di, L., Guo, L., Zhang, C., & Chen, F. (2022). Spatio-Temporal Responses of Precipitation to Urbanization with Google Earth Engine: A Case Study for Lagos, Nigeria. Urban Science, 6(2), 40. https://doi.org/10.3390/urbansci6020040
1. Molla, A., Mitra, C., & Vasconcelos, J. (2022). Assessment of and Solutions to the Stormwater Management System of Auburn University Campus in Auburn, Alabama. Journal of Water Management Modeling. https://doi.org/10.14796/JWMM.C488

IN-PROGRESS

1. Molla, A., Flores, A., D.J. Sailor: Mitigating Data Gaps and Disparities in Access to Air Quality Information: A Case Study of Maricopa County, Arizona.

DISSERATION, THESIS, & PROJECT

Ph.D. DISSERTATION (Arizona State University)

Topic: *Long-term spatio-temporal changes of temperature and air quality and its impacts on human life in Maricopa County, Arizona* (tentative).

Co-advisors: Drs. David Sailor and Aaron Flores.

M.S. PROJECT (George Mason University)

Topic: *Improved understanding of precipitation patterns over multiple urban systems.*

Advisor: Dr. Liping Di

M.S. THESIS (Auburn University)

Topic: *Towards Urban Sustainability: Stormwater Management and Solar Power Potential of Auburn University.*

Advisor: Dr. Chandana Mitra

UNDERGRADUATE THESIS (Khulna University)

Topic: *Urban Form Analysis of Selected Secondary Cities in Bangladesh.*

Advisor: Dr. Ahsanul Kabir

AWARDS

2024: 'Graduate College Travel Award (amount: 300 USD), Arizona State University.

2024: 'Graduate and Professional Student Association' (GPSA) Research Travel Grant (amount: 950 USD), Arizona State University.

2019: 'Geosciences Advisory Board' (GAB) Student Travel Grant (amount: 500 USD), Auburn University.

2019: 'Bangladesh-Sweden Trust Fund' (amount: 50,000 BDT), Economic Relations Division; Government of People's Republic of Bangladesh.

2012 – 2015: Annual Merit-based Scholarship (amount:10,000 BDT each cycle), Khulna University; Bangladesh.

PROFESSIONAL SKILLS

Geographic Software: ArcGIS Pro, QGIS

Remote Sensing: ERDAS Imagine, CloudCompare, Pix4D

Programming Language & Others: Python, R JavaScript, HTML, Git Version Control

Integrated Development Environment (IDE): Microsoft Visual Studio, IntelliJIDEA

Operating System: Windows, Linux (Ubuntu), Mac

CLOUD PLATFORMS

- *Sol Supercomputer*; Arizona State University.
- *ARGO/Hopper Supercomputer*; George Mason University.
- *Google Colab, Google Earth Engine*; Google.

DATA SCIENCE

MACHINE LEARNING

Regression: Linear, Logistic, Polynomial, Ridge, LASSO, ElasticNet

Classification: K-Means, DBSCAN, SVM, K-Nearest Neighbors, Decision Tree, Naïve Bayes, Random Forest, Gradient Boosting.

Clustering: Agglomerative Hierarchical.

Dimensionality Reduction: Principal Component Analysis.

DEEP LEARNING

Convolutional Neural Network: VGG, ResNet.

Framework: TensorFlow, PyTorch.

API: Keras

RELEVANT COURSEWORKS

- **Deep Learning for Geographic Information Systems**

Learned basic deep learning tasks in Geoinformatics. Applied 'Deep Transfer Learning' concept to detect buildings footprint as a final project.

- **Scientific Data Mining for Geoinformatics**

Learned several theoretical aspects of machine learning such as classification, clustering, regression analysis. Completed a Land Use land Cover Classification as a final project.

- **Drone Remote Sensing**

Learned UAV RGB, multispectral, and hyperspectral image analysis. Learned CloudCompare, Pix4D software for practical demonstration. Applied 'Structure from Motion', 'LiDAR' technique for urban 3D reconstruction.

- **Earth Image Processing**

Learned image processing tasks with Python. Completed a task of flood-damaged building detection as a final project.

- **Social Media Analysis**

Learned 'Linux' (Ubuntu) operating system for programming. Used Twitter data for sentiment analysis for final project.

- **Interoperability of Geographic Information Systems**

Learned OGC, FGDC standards for geospatial data. Acquired knowledge on 'UML' language.

- **Introduction to GIS Algorithms & Programming**

Learned fundamental algorithms and programming in GIS. Learned to write simple algorithm for GIS tool.

- **Advanced GIS**

Learned spatial analysis using ArcPy. Performed spatial statistical analyses in ArcGIS and R

RESEARCH & TEACHING POSITIONS

- *Fall 2023 to Present:*

Graduate Research Assistant, Southwest Urban Corridor Integrated Field Laboratory (SW-IFL), School of Geographical Sciences and Urban Planning (SGSUP); Arizona State University.

- *Fall 2020 to Spring 2023:*

Graduate Research Assistant 'Center for Spatial Information Science and Systems' (CSISS), Department of Geography and Geoinformation Science; George Mason University.

- *Summer 2020:*

Graduate Research Assistant, Department of Geosciences; Auburn University.

- *Spring 2020:*

Teaching Assistant, '**Geographic Information Systems'** course, Department of Geosciences; Auburn University.

- *Fall 2019:*

Teaching Assistant, '**Aerial Photography and Remote Sensing**' and '**Geographic Information Systems**' courses, Department of Geosciences; Auburn University.

- *Fall 2018 to Summer 2019:*

Teaching Assistant, **'Global Geography'** course, Department of Geosciences; Auburn University.

MENTORING

- *March 15 to Present:*

Mentoring ***Megan Henriksen*** – a Master of Advanced Studies in GIScience (MAS-GIS), Arizona State University on her capstone project on air temperature variation in Arizona; USA.

- *February 29 to May 03, 2024:*

Mentored ***Trevon Chow*** - a high school student from *BASIS Ahwatukee High School*, Phoenix Arizona for his project on Urban Heat Island (UHI).

INDUSTRY EXPERIENCES

- *January 2018 to June 2018:*

GIS Analyst, Modern Engineers and Planners Consultancy Ltd, Dhaka, Bangladesh.

- *January 2017 to December 2017:*

Junior GIS Specialist**,** Geo-Planning for Advanced Development (GPAD), Dhaka, Bangladesh.

INTERNSHIP

- *May 2014 to June 2014:*

RAJDHANI UNNAYAN KATRIPAKKA (RAJUK, the Bangladesh govt authority for Dhaka city planning), Dhaka; Bangladesh.

ORAL PRESENTATION

- ✓ Molla, A., Flores, A., Sailor, D. (2024). Assessing Disparities in Access to Air Quality Information in Maricopa County, Arizona. AAG Annual Conference, Honolulu, Hawaii, 16 - 20 April 2024.
- ✓ Molla, A., Mitra, C. (2019). Sustainable Stormwater Management for Auburn University Campus, AL. AAG Annual Conference, Washington, DC, 03 - 07 April 2019.

POSTER PRESENTATIONS

- ✓ Molla, A. (2024). A machine Learning Approach to Predict Census Block Group Level Air Temperature and Explore Inequalities in Exposure: A Case Study of Maricopa County, Arizona. Graduate and Professional Student Association (GPSA) Organized 3 Minutes (3MT) Thesis Presentation, Arizona State University, 12th April 2024.
- ✓ Molla, A., Flores, A., Sailor, D. (2024). *Mitigating Data Gaps and Disparities in Access to Air Quality Information: A Case Study of Maricopa County, Arizona*. Urban Climate Research Center (UCRC) *Annual Anthony Brazel Lecture,* Arizona State University, 21st March 2024.
- ✓ Molla, A., Flores, A., Sailor, D. (2024). Disparities in Access to Air Quality Information at Maricopa County, Arizona. *Department of Energy, Office of Science team visit*, Arizona State University, 14th February 2024.
- ✓ Molla, A., Mitra, C. (2019). Stormwater Management and Solar Power Potential of Auburn University Campus, AL. *Graduate Student Research Symposium,* Auburn University, 9 April 2019.

CERTIFICATES

- ✓ Collaborative Institutional Training Initiative (2023): *RCR – Graduate Student and Postdoctoral Researcher Responsible Conduct of Research.*
- ✓ Udemy (2022): *Machine Learning, Data Science and Deep Learning with Python.*

- ✓ NASA (2022): *Earth Observations Toolkit for Sustainable Cities and Human Settlements.*
- ✓ NASA (2021): *Introduction to NASA Resources for Climate Change Applications.*
- ✓ LinkedIn (2021): *Learning Java.*
- ✓ ESRI (2020): *Spatial Data Science: The New Frontier in Analytics.*

SERVICES

- ✓ Program Representative (AY: 2021 to 2022):

'Graduate and Professional Student Association' (GAPSA) – George Mason University.

- ✓ Board Member (AY: 2021 to 2022):

'International Student Advisory Board' (ISAB) – George Mason University.

ORGANIZING SESSION & CO-CHAIRING

- ✓ Session Co-Chair (2024):

04/19/2024: Environmental Data Deserts (1 & 2): Understanding the Causes and Consequences of the Unequal Coverage of Environmental Monitoring Networks. *American Association of Geographers (AAG) Annual Conference; Honolulu Hawaii.*

- ✓ Session Organizer (2024):

Environmental Data Deserts (1 & 2): Understanding the Causes and Consequences of the Unequal Coverage of Environmental Monitoring Networks. *American Association of Geographers (AAG) Annual Conference; Honolulu Hawaii.*

- ✓ Session Organizer (2019):

American Association of Geographers (AAG) Annual Conference; Washington D.C.

PROFESSIONAL MEMERSHIPS

2018 to Present: *American Association of Geographers (AAG).*

2016 to Present: *Bangladesh Institute of Planners (BIP).*

LANGUAGES

- ✓ English: Reading (fluent), Writing (fluent), Speaking (fluent), Listening (fluent).
- ✓ Bengali: Reading (native), Writing (native), Speaking (native), Listening (native).

Referees: Available upon request.