Hasnat Aslam

Curriculum Vitae

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Github | Google Scholar | Linkedin

Education

Ph.D. (Computer Science and Natural Resources)	University of Nebraska Lincoln (Nebraska, US)	Enrolled
MS. (Computer Science)	University of Nebraska Lincoln (Nebraska, US)	Aug 2024
M.Phil./MS (RS AND GIS)	University of the Punjab (Lahore, Pakistan)	Dec 2018

Research Interests

- Data Analytics, Machine learning, GIS and Predictive modelling

Research Experience

University of Nebraska-Lincoln

Jan 2021 – Oct 2022

Graduate Research Assistant

- Conduct analysis on diverse datasets across multiple projects.
- Design and manage databases for spatial and non-spatial data, focusing on Genome and Environment (GxE) modeling.
- Develop and maintain web applications and design models to support project goals.
- Create and optimize algorithms for genome data preprocessing.
- Conduct flood-related studies and create GIS-based visualizations for enhanced understanding and communication.

University of the Punjab

Oct 2015 – Jun 2016

Graduate Research Assistant

- Perform hydrologic and hydraulic modeling to assess water flow and flooding scenarios.
- Conduct advanced GIS analysis and create detailed mapping solutions for spatial data representation.
- Utilize remote sensing techniques and digital image processing to extract and analyze environmental data.

Teaching Experience

- ***Spring 2022***: **Teaching Assistant,** Introduction to Geospatial Technologies (NRES 218)
  - Instructed two sections (Lectures on methods, technologies, and background).
  - Supervised, organized and evaluated labs.
  - Guide students in their Semester Project preparation.

- ***Fall 2021*: Teaching Assistant,** Introduction to Spatial Science (GEOG 312)
  - Instructed four sections (Lectures on methods, technologies, and background).
  - Supervised, organized, and evaluated labs and exams.

- ***Fall 2021***: **Learning Assistant,** Science and Decision Making (SCIL 101)
  - Supervised and organized recitation sections.
  - Assisted students in Semester Project preparation.
  - Evaluated Assignments and Projects.

Professional Experience

National Drought Mitigation Center

Oct 2022 – Present

GIS Specialist II

- Developed and implemented data engineering pipelines for extracting, cleaning, and transforming large geospatial datasets for analytics and mapping.
- Applied machine learning algorithms to predict drought conditions.
- Designed complex geospatial data visualizations to communicate insights to stakeholders.
- Collaborated with cross-functional teams to develop tailored GIS solutions.
- Maintained and updated geodatabases, ensuring seamless data integration and efficient retrieval.

Agriculture Department

Jan 2019 – Nov 2020

GIS Analyst

- Developed web-based geospatial applications to enhance agricultural data accessibility.
- Managed an AI-driven system for fertilizer recommendations to improve crop productivity.
- Integrated GIS data and remote sensing into maps to enhance decision-making.
- Contributed to the development of the central GIS portal and optimized ArcGIS database management.
- Performed data analytics and compiled annual reports to support strategic agricultural planning.
- Engaged in research initiatives focused on agricultural innovation and improvement.

PIU, FERRP, Provincial Disaster Management Authority

Jul 2018 – Dec 2018

Consultant

- Hydrological and hydraulic modelling to evaluate flood hazard in major rivers and flash flooding.
- Compiled and integrated in-situ, remote sensing, and cartographic data.
- Conducted data analysis for flood risk assessments and mitigation strategies.
- Designed spatial databases and data engineering pipelines for efficient data management.
- Implemented data compression strategies for managing large datasets effectively.
- Integrated analytical results with web frameworks for broader accessibility.
- Supported team efforts in analysis, documentation, and data modeling tasks.

PCU, FERRP, Planning and Development Department

Jul 2016 – Jun 2018

Researcher

- Compiled field, remote sensing, and cartographic data for use in analysis and mapping.
- Conducted hydrological and hydraulic modeling for various flood types.
- Contributed to the design of spatial databases and development of web frameworks.
- Participated in research to study the impacts of climate change on flooding.

- Assisted in designing a Flood Early Warning System (FEWS) to enhance disaster preparedness.

Urban Sector Planning and Development Unit

Mar 2015 – Jun 2015

Data Entry Operator/ GIS Technician

- Digitized and created geo-databases for various land use classes and buildings.
- Linked geo-databases with surveyed datasets for comprehensive data integration.
- Scanned and archived documents in databases to maintain essential tax records systematically.

Awards

- International Union of Geodesy and Geophysics (IUGG) travel grant 2019.
- Doctoral Program Coordination Committee (DPCC), University of the Punjab 2016.

Publications

[1] Castelli, G., Howard, B. C., Adyel, T. M., AghaKouchak, A., Agramont, A., Aksoy, H., … Ceperley, N. (2025). Co-creating water knowledge: a community perspective. Hydrological Sciences Journal. https://doi.org/10.1080/02626667.2025.2571065

[2] Tadesse, T., Connolly, S., Wardlow, B., Svoboda, M., Zhang, B., Fuchs, B. A., ... & Riganti, C. (2025). Development and Evaluation of the Forest Drought Response Index (ForDRI): An Integrated Tool for Monitoring Drought Stress Across Forest Ecosystems in the Contiguous United States. *Forests*, *16*(7), 1187.

[3] Raza, D., Shu, H., Mirza, S., **Aslam, H**., Tariq, A., Aslam, R. W., ... & Ali, M. M. (2025). Multicriteria Evaluation of Cropland Suitability using Multisource Datasets of Satellite Remote Sensing and Ground Observation. *Physics and Chemistry of the Earth, Parts A/B/C*, 103978.

[4] Raza, D., Shu, H., Ehsan, M., Fan, H., Abdelrahman, K., **Aslam, H**., … Sardar, A. (2025). Evaluation of agriculture land transformations with socio-economic influences on wheat demand and supply for food sustainability. Cogent Food & Agriculture, 11(1). https://doi.org/10.1080/23311932.2024.2448597

[5] Raza, D., Shu, H., Nazeer, M., **Aslam, H**., Mirza, S., Xiao, X., ... & Aeman, H. (2024). Improved method for cropland extraction of seasonal crops from multi-sensor satellite data. *International Journal of Remote Sensing*, *45*(18), 6249-6284.

[6] Raza, D., Khushi, M., SHU, H., **Aslam, H**., Saleem, M.S., Ahmad, A., Mirza, S., Saeed, U. and Khan, S.U., 2024. CA-ANN based LULC prediction and influence assessment on LST-NDVI using multi-temporal satellite images. *Environmental Earth Sciences*, *83*(5), pp.1-20.

[7] Sarzaeim, P., Muñoz-Arriola, F., Jarquin, D., **Aslam, H**. and De Leon Gatti, N., 2023. CLIM4OMICS: a geospatially comprehensive climate and multi-OMICS database for Maize phenotype predictability in the US and Canada. *Earth System Science Data Discussions*, *2023*, pp.1-35.

[8] Raza, D., Shu, H., Khan, S.U., Ehsan, M., Saeed, U., **Aslam, H**., Aslam, R.W. and Arshad, M., 2022. Comparative geospatial approach for agricultural crops identification in interfluvial plain-a case study of Sahiwal district, Pakistan.

[9] Raheem, A., Sajid, M., Iqbal, M.S., **Aslam, H**., Bilal, M. and Rafiq, F., 2019. Microbial inhabitants of agricultural land have potential to promote plant growth but they are liable to traditional practice of wheat (T. aestivum L) straw burning. *Biocatalysis and agricultural biotechnology*, *18*, p.101060. https://www.sciencedirect.com/science/article/abs/pii/S1878818118310193

Data

[1] **Aslam, H**., Sarzaeim, P., & Munoz-Arriola, F. (2023). CLImate for Maize OMICS: CLIM4OMICS Analytics and Database (2.0) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.8002909.

[2] Sarzaeim, Parisa, **Aslam, Hasnat**, & Munoz-Arriola, Francisco. (2023). CLImate for Maize OMICS: CLIM4OMICS Analytics and Database (1.0) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.7490246.

Presentations

Oral Presentations

December 10, 2024 Giulio Castelli, Dr. Caitlyn A Hall, Amobichukwu Amanambu, Mariana Madruga de Brito, Hamouda Dakhlaoui, Rajendran Shobha Ajin, Kalpana Chaudhari, Salvatore Manfreda, Cristina Caramiello, Christophe Cudennec, Aster Hordofa, Afua Owusu, Luigi Piemontese, Meriam Lahsaini, Leon Hermans, Gerbrand Koren, Britta Höllermann, ***Hasnat Aslam***, Stefan Krause, Ben Howard, Yonca Cavus, Maria Rusca, Anna Scolobig, Anandharuban Panchanathan, Serena Ceola, Ahmed Elshenawy, Amir AghaKouchak, Tommaso Pacetti, Fardous Zarif, Hafzullah Aksoy, Fajr Fradi, Kwok Pan Chun, Elena Bresci, Lorenzo Villani, Moctar Dembélé, Natalie C Ceperley and Wouter Buytaert. (2024): **Co-creation as a Lever of Science for Solutions in Hydrology and Water Resources Management: A Community Perspective** . In *Fall Meeting 2024*. AGU.

July 16, 2023	***Aslam, H***., Munoz-Arriola, F. (2023): **Integration of biophysical data in a hydrologic knowledge graph precursor for water and carbon tradeoffs**, XXVIII General Assembly of the International Union of Geodesy and Geophysics (IUGG) (Berlin 2023). https://doi.org/10.57757/IUGG23-4784
December 16, 2022	***Aslam, H***., & Munoz-Arriola, F. (2022, December). **Towards the Design of Large-scale Hydrologic Knowledge Graphs for Data Integration, Management, and Analytics for data-driven models**. In *Fall Meeting 2022*. AGU.
January 24, 2022	***Aslam, H.***, & Munoz-Arriola, F. (2022, January). **Climate Visualization Analytics for the performance GxE modeling (phenotype predictability software) large scale experiment.**). 21st Conference on Artificial Intelligence for Environment Science (American Meteorological Society Annual Meeting).
January 24, 2022	Sarzaeim, P. ***Aslam, H***., Quinones, R. & Munoz-Arriola, F. (2022, January). **Developing of Climate Spatiotemporal and Analytical Visualization for Maize Response to Climate.** 21st Conference on Artificial Intelligence for Environment Science (American Meteorological Society Annual Meeting).
July 18, 2019	***Aslam, H.*** Ashraf, A. Yaseen, H. and Zain, U. **Specific Sampling Strategy Significance and Impact on Bayesian Sensitivity Analysis for Hydraulic Model**, in IUGG General Assembly, Montréal, Québec, Canada, 2019, p. 289. http://iugg2019montreal.com/abstract-book.html

Poster Presentations

January 10, 2023	Mig, M., Munoz-Arriola, F., Aslam, H., & Quiñones, R. (2023, January). **Improving Precipitation Data for Diagnostics of Extreme Hydroclimate Events Coupling Singular Spectrum Analysis and Machine Learning Analytics**. In *103rd AMS Annual Meeting*. AMS.
December 16, 2022	Jain, J. Munoz-Arriola, F. Khare, D. Aslam, H., & Sarma, Arup K. (2022, December). **Multi-scale Flood and Governance for Risk Assessments in India: A Framework**. In *Fall Meeting 2022*. AGU.

August 09, 2022	Aslam, H., & Munoz-Arriola, F. **Data Management and Visualization Architecture for the Integration and Modeling of Climate and OMICS Data for GxEmodeling**. *NAPB Annual Meeting 2022*, 2022.
May 26, 2016	Aslam, H., Hamid, Q. **Identification of Suitable Location for Solar Panel Using 3D Model.** International Conference**,** University of the Punjab (Lahore, Pakistan).

Certification

- IBM DATA SCIENCE

Leadership and Services

- ***December 2024 – Present*:** Member of **IANR Staff Council**, IANR, University of Nebraska Lincoln.
- ***August 2023 – Present*:** Member of **Graduate Committee** (SNRGSA Rep.), SNR, University of Nebraska Lincoln.
- ***January 2023 – July 2024*:** Served as a **Treasurer** of Pakistan Student Association at the University of Nebraska Lincoln.
- ***November 2021 – July 2022*:** Served as a **Vice Chair** of School of Natural Resources graduate student association at the University of Nebraska Lincoln.
- ***May 2019 - March 2020*:** Served as **Administrative Officer** for the fertilizer cell in the Department of Agriculture, Government of Punjab, Pakistan.

Current Professional Affiliations

- International Association of Hydrological Science.
- Mapping Science Institute Australia.
- Global Land Program.
- River Basin Management Society.
- Community Surface Dynamics Modelling System.
- International Commission of Statistical Hydrology.
- National Council for Geographic Education.
- Python Software Foundation.