

Muhammad Qasim

Graduate Teaching Assistant, University of Houston, TX

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EDUCATION

Ph.D. Geology - University of Houston, TX USA

Expected Graduation: May. 2024

Dissertation: Study of rocks and economic minerals using advanced remote sensing and GIS techniques

GPA: 3.95/4.00

MS Remote Sensing & GIS - COMSATS University, Islamabad, Pakistan

Jun. 2019

Thesis: Mineral Information Extraction and Lithological Mapping of Rocks through EO-1 Hyperion Image

GPA: 3.87/4.00

BS (Hons.) Applied Geology - University of the Punjab, Lahore, Pakistan

Sep. 2011

Thesis: Geological mapping of Dhokri-Choha area, West Central Salt Range, District Khushab with special emphasis on sedimentology of the Late Permian succession (Amb Formation and Wargal Limestone) [5] [7]

GPA: 3.64/4.00

RELEVANT COURSEWORK

- Spatial Analysis and Applications
- Remote Sensing
- Seismic Structural Geology
- Geostatistics
- Igneous Petrology
- Satellite Positioning and Geodesy
- Data Analysis and Machine Learning

WORK EXPERIENCE

Research (Ph.D.) - University of Houston, TX

Aug. 2019 - Present

Study of Rare Earth Elements in Death Valley, Utah using the Senop hyperspectral camera mounted on DJI MATRICE drone (In progress)

Geological mapping of Naweoba ophiolite in Balochistan, Pakistan using ASTER, Sentinel 2B, and laboratory-based hyperspectral images [1]

Teaching Assistant - University of Houston, TX

Aug. 2019 - Present

Instruct the labs. of:

Spatial Analysis & Applications (*Intro to ArcGIS Pro, Digitization, Spatial Analysis, Map Automation using Python, Surface Hydrology, Groundwater Hydrology, Hotspot Analysis*)

Remote Sensing (*Intro to ENVI 5.6, Spectrometry and Digital Images, Multispectral and Hyperspectral Images, Thermal Remote Sensing, Image Registration & Calibration, Spectral Unmixing, Image Classification & Detection, Analysing Radar and InSAR data*)

Sedimentology & Stratigraphy

Physical Geology

Assistant Director (Geology) - Geological Survey of Pakistan (Ministry of Energy)

Jun. 2014 - Jul. 2019

Pioneered the geodatabase development of 70 years of the research work of the Geological Survey of Pakistan, using advanced GIS, Google Earth Pro, and remote sensing techniques [2] [6]

Prepared the detailed digital Mineral Map of Pakistan using advanced GIS and remote sensing techniques, my role as one of the members of the pioneered team [3] [6]

Performed the geochemical mapping of Pakistan at a scale of 1:50,000 in collaboration with the China Geological Survey

Collaborated with Japan International Cooperation Agency (JICA) to perform other geological and geochemical mapping projects in Pakistan [4]

PUBLICATIONS

PAPER PUBLICATIONS

- [1] **Muhammad Qasim**, Shuhab D. Khan, Rashid Haider, Mehboob ur Rasheed, 2022. *Integration of multispectral and hyperspectral remote sensing data for lithological mapping in Zhob Ophiolite, Western Pakistan*, Arabian Journal of Geoscience, Article No. 599, <https://doi.org/10.1007/s12517-022-09788-8>
- [2] **Muhammad Qasim**, 2018, *Status of Geological Mapping in Pakistan - A Transformation from Pictorial Representation to Geodatabase Management*, Geol. Surv. Pakistan, Map No. G03-21
- [3] Nagma Haider, Rashid Haider, **Muhammad Qasim**, Aun Zahoor, 2018, *Mineral Map of Pakistan on a scale of 1:1,500,000*, Geol. Surv. Pakistan, Map No. G18-32
- [4] Nadeem Ahmed Usmani, S. Ahsan Hussain Gardezi, **Muhammad Qasim**, 2017, *Geological Mapping and Mineral Exploration of Sumal Quadrangle 42H/11, Ghizer District, Gilgit Baltistan, Pakistan*, Geol. Surv. Pakistan, Inf. Rel. No. G17-22
- [5] Naseem Aadil, **Muhammad Qasim**, Atif Hussain, 2012, *Sedimentology of the Upper Permian Amb Formation, West Central Salt Range, District Khushab, Pakistan*, Pakistan Journal of Science, Vol. 65, No. 04

CONFERENCE/ PROCEEDINGS

- [6] Nagma Haider, Rashid Haider, **Muhammad Qasim**, Aun Zahoor, 2018, *Status of Geological Mapping by Geological Survey of Pakistan and Mineral Map of Pakistan (1:1,500,000) - A Transformation from Pictorial Representation to Geodatabase Management*". Journal of Himalayan Earth Sciences (Abstract Volume), 5th International Conference on: Earth Sciences Pakistan 11-13 Aug., 2018, Pakistan.
- [7] Nisar Ahmed, Mutti ur Rub, Atif Hussain, Shahid Latif, **Muhammad Qasim**, 2012, *Microfacies Analysis and Reservoir Potential of Wargal Limestone (Upper Permian), Dhokri Choha Area, West Central Salt Range, Pakistan*, PAPG/SPE Annual Technical Conference, December 4-5, Islamabad, Pakistan

AWARDS & SCHOLARSHIPS

<i>Earth and Atmospheric Sciences Outstanding Graduate Research</i> - University of Houston	2022
<i>Graduate Tuition Fellowship</i> - University of Houston	2017 - Present
<i>Presidential Endowment Fellowship</i> - University of Houston	2017 - Present
<i>Earth and Atmospheric Sciences Student Excellence Scholarship</i> - University of Houston	2020
<i>Academic Excellence Scholarship (1st Position)</i> - COMSATS University, Islamabad	2017, 2018, 2019
<i>GPA-based Departmental Scholarship (1st Position)</i> - University of the Punjab	2006 - 2011

SOFTWARE AND EQUIPMENT SKILLS

- ArcGIS Pro 2.8, ArcGIS Online (AGOL), and ArcGIS Desktop 10.8
- ENVI 5.6
- Google Earth Pro
- Python programming
- Structure Solver, Global Mapper, Corel Draw, SNAP, SIMIS, and Microsoft Office

Hyperspectral Cameras SPECIM (*Laboratory-based and Terrestrial Hyperspectral Image collection*)

ASD Spectroradiometer FieldSpec Pro FR (*Laboratory and Field material signature collection*)

SENOP HSC-2 Hyperspectral Camera

Mounted on DJI MATRICE Drone (for airborne hyperspectral image acquisition)

Mounted on an optical microscope (for thin section hyperspectral micro-image acquisition)