



## Muhammad Umair

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### WORK EXPERIENCE

#### Senior Full Stack Engineer

**GeoSolutions** [ 23/10/2023 – Current ]

**City:** Remote

**Country:** Italy

Responsibilities involved but not limited to are:

- Code, develop, test, and maintenance of software applications, and optimize deployment pipeline.
- Implementing and ensuring compliance with ES Lint coding standards
- Work on adding up React components for Front-end of Map-Store
- Responsible for handling/debugging back-end issues in Geo-node.
- Debugging and Solving product related problems
- Providing Customer support for software, issues, deployments etc.
- Taking solution-oriented initiatives
- Active member of Geonode Development Team
- Handling & working on GitHub Issues

#### Software developer

**Ladar Ltd.** [ 26/5/2023 – 23/10/2023 ]

**City:** Remote

**Country:** United Kingdom

Responsible for:

- Tech Team Meetings Discussion
- Design Back-end Architecture & flow diagrams
- R & D for suitable back-end architecture
- Handling of back-end related JIRA tickets
- Design & development of code for writing up back-end APIs
- Deployment of Micro-services
- Usage of Docker for optimized performance
- Handling of spatial dataset for creation of spatial databases

#### Manager - Lead GIS Developer

**Pakistan Space & Upper Atmosphere Research Commission ( SUPARCO )** [ 1/5/2016 – 20/6/2023 ]

1. Responsible for planning & execution of projects from scratch to deployment
2. Leading the team of developers as active involvement with GIS Engineers and GIS Analysts to ensure that presentation of data is consistent with internal geo-spatial databases their processes and methods
3. Built tools and processes in conjunction with other engineering and product teams for the on-time, quality release of data products, services and applications

4. Monitored daily activities of the Teams working to maintain & organize Remote Sensing raw datasets, their derived products & Spatial / Non Spatial Databases
5. Managing developed products, associated spatial databases and datasets, and GIS services
6. Creating, managing, and troubleshooting services for maps, features class, and Geo-processing using server and related tools
7. Creating user information solutions and analytic solutions by developing, implementing and maintaining data components and interfaces
8. Diagnosing, troubleshooting, and resolving the complex system application issues, and identifying, analyzing, and fixing bugs and performance issues as needed
9. Assisting the management with GIS strategic planning by researching and staying abreast of industry trends, marketplace solutions, and emerging technologies
10. Identifying and troubleshooting the Geo-database issues and the ability to analyze, design, build, test and implement solutions.
11. Responsible for Geo-database security, integrity, reliability, high availability and disaster recovery solutions.
12. Participation in project proposal meetings with key partners and customer

### **Assistant Manager - Software Developer**

**Pakistan Space & Upper Atmosphere Research Commission ( SUPARCO )** [ 2/10/2010 – 30/4/2016 ]

1. Core member of development team responsible for solutions delivery.
2. Using GIS and RS for design & implementations of large scale geo-spatial systems
3. Development of techniques & methods for faster & efficient display of Satellite Remote Sensing data over multi domain web based mapping applications using open source tools/libraries
4. Development and maintenance of demographic data sets
5. Writing up codes & scripts to automate processes for avoiding unnecessary delays
6. R & D that revolved around Image pyramids, overviews & tiling mechanisms for faster rendering of large amount of SRS datasets ( > 7 TB)
7. Handling of large amount of multiple satellites sensor's data across the region

### **Jr. Software Engineer**

**Tradepoint 360.** [ 1/8/2009 – 31/10/2010 ]

1. Writing out code for sub modules of a .Net POS Solution
2. Assisting Team with a .Net POS Solution
3. Debugging & Error testing for the .Net POS Solution
4. Writing out knowledge base articles
5. Handling out complaints/issues tickets
6. Providing after sale customer support to clients

## **PROJECTS**

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### **Lead DevOps Engineer**

[ 1/2023 – Current ]

Working as Web Developer and GIS expert professional at Levant Consulting, Lahore in “**Expansion and Integration of Database Development for Flood Simulations in Decision Support System in Sindh Flood Emergency Rehabilitation Project (SFERP)**” funded by the **World Bank's** Sindh Flood Emergency Rehabilitation Project (SFERP). Technical expert responsible for handling of development operations related to development, deployment and maintenance of the project.

### **Web GIS Expert**

[ 8/2022 – 3/2023 ]

- Worked as a freelancer for Levant Consulting, Lahore for the adding enhancements and functionalities to the developed portal for the “**Preparation of an Inventory of Indus Embankments and Breaching Sections**”

to Document their Condition and Informed Disaster Risk & Hazard Mapping" under World Bank funded 'Sindh Resilience.

- Adding up following components for the project: Ingestion of spatial datasets into the database, generation of new views, writing up code for front-end GUI using open-source libraries, optimizing resources / overall functionalities, implementation of SSL for the portal and successful deployment of the portal on the server.

### SLMS Development Lead

[ 4/2021 – 12/2022 ]

- An SLMS was built for the project "BTSIP – Billion Tree Tsunami Project" under funding of Government of KPK, Pakistan.
- Portal acted as geo-visualization tool which allow users to view data for a specific forest region or administrative boundary
- Multi-year and multi-scale satellite imagery was used in the process and hosted via a datastore
- Four different types of GIS analysis were performed and depicted on the portal namely Thematic Change Detection, Forest Elevation Modelling, Forest Phenology and Land-use Land Classification
- Users could use swipe tool, overlay analysis tool, spy tools to compare the areas between 2 different years
- All the portal was auto generated via database tables using a specific name format for each table.
- A desktop tool was also designed to allow users to upload shapefiles to the database directly which in turn were dynamically reflected on the web portal.

### Web GIS Developer

[ 12/2020 – 4/2022 ]

- Worked as Project lead and lead GIS Developer for " **Data-As-a-Service**" project. Project offered salient features like 1) Develop an online licensing service of satellite remote sensing data and derived data products 2) Provide a common satellite remote sensing data platform for software based geospatial applications development in national planning and governance processes 3) Provide geospatial planning resource for socio-economic development and monitoring 4) Diminution of national dependency on open / international satellite image sources / services so as to support the national exchequer
- Worked to help GIS illiterate users make use of best possible GIS approaches
- Allowed users to perform GIS based vector and raster operations on the web portal itself
- Web based processing Service was integrated for on the fly processing concept

### GIS Developer

[ 1/2019 – 12/2022 ]

- Worked as a Project lead and lead developer in SUPARCO for the project "**Order Management System**" funded by Government of Pakistan (GoP). Project offered 1) allow data cataloging of geospatial information including satellite imageries, multi-format datasets and their derived products 2) online, easy & flawless dissemination, 3) centralized database for all the raw datasets 4) data & application clustering 5) Segregation of users based on their authorizations 6) Security 7) metadata standardization
- Project was completed on critical timelines despite COVID-19 pandemic
- Was conferred with a Distinguished Service Medal for the same project for delivering this out of the box solution despite lock downs and strict policies

### Online Satellite Imagery Service

[ 1/2019 – 12/2020 ]

- An online python and PHP API based web map service was served to the user that hosted latest Satellite Remote Sensing data available at SUPARCO's end.
- Authorization, cryptography process using PHP, obfuscation techniques were used to make data integrity perfect
- Watermark approach was used for unofficial use of imagery in any other app or solution.

## Web GIS R & D

[ 2/2018 – 3/2019 ]

- Took an initiative for discovering best possible approach to achieve fastest rendering of imagery tiles on the web
- R & D was undertaken as Tile Cache was not performing up to the mark and satellite remote sensing dataset was increasing due to addition of new satellites every year.
- Study involved handling SPOT 5,6,7 Pleiades, Pleiades Neo and all other openly available satellites
- Multiple benchmarks were met to choose Map proxy over Tile Cache as preferred tile caching mechanism.
- It involved using slave/master concept for Geoserver to have only 1 master Geoserver and n number of slave Geoserver clustered horizontally as well as vertically using Apache Tomcat, hypervisor-v to serve the solutions in fastest possible way.

## GIMINT Apollo Catalog

[ 4/2012 – 12/2012 ]

- Worked as web GIS expert for developing an in house tool to help *Geo spatial Imagery Interchange Dte.* Automate and monitor their activities more thoroughly and view overall work being done interactively over a map view. Data was dynamically being pulled using micro services and eventually displayed on the map for end-users.
- ERDAS Apollo was fully customized and adopted to needs of the user. It was deployed on the server of directorate to make full use of infrastructure as well as resources.

## Flood-watch Monitoring App

[ 9/2015 – 12/2016 ]

- Worked as lead developer to build an inhouse flood-watch monitoring app which was built custom using latest open-source technologies and aimed to replace old version of **Disaster Watch** ([disasterwatch.sgs-suparco.gov.pk](http://disasterwatch.sgs-suparco.gov.pk)) which was built using QGIS Server, QGIS Web Client. Portal was built on top of Open Layers, PostgreSQL + PostGIS and MySQL databases.
- Salient features included offering users to view time-series of results derived for HEC-RAS model for the selected dates, also the flood could be dynamically viewed from country till tehsil level administration, generate PDF based report on the fly and download specific data.

## Web GIS Developer

[ 8/2012 – 12/2015 ]

- Worked as lead developer for the project “**Aks-e-Pakistan**”, it was an out of the box solution aimed to serve the satellite imagery SUPARCO received throughout the year on its own independent servers and portal. Purpose was to replicate a national level spatial data infrastructure that would hold all the datasets centralized at a central location and would serve both the public & private users.
- Responsible for developing, deployment and successful running of the portal using latest cutting-edge web-based technologies, libraries and open-source tools available. All the code was written from scratch on top of highest-level hardware level infrastructure that involved clustering on hardware as well as software level (horizontal & vertical)
- Solution included country level raw satellite imagery for whole Pakistan and housed around 100 vector spatial datasets on top of it
- Solution was aimed on reducing reliance over the enterprise level solutions available at that time and deliver an in-house solution to the problems using latest software with full customization.
- Solution was built on top of Open layers, Geoserver worked as datastore, PostgreSQL with PostGIS extension was used for handling all the spatial datasets, MySQL was used to handle all non-spatial database operations, GDAL was used to do raster handling / manipulations and map proxy was used python preferred tiling scheme for fastest rendering of the multiple satellite imageries.

## Web GIS Expert

[ 5/2011 – 4/2014 ]

- Responsible for developing a web-based GIS portal under project “**Mauza-Level Digitization for Punjab Province Phase-1**”, solution was originally written using simple HTML page with data being served from

Google Fusion Tables which was a breach of data and security due to data being uploaded on the google servers.

- App was re-written in ASP.Net, every spatial and non-spatial dataset was held in MySQL database. Solution produced was more robust, scalable and independently hosted on SUPARCO's servers

## Software Developer

[ 9/2012 – 4/2013 ]

- Worked as software developer for writing up a customized Proof of a concept app on behalf of SUPARCO for Election Commission of Pakistan which would act as General Elections 2013 results dissemination desktop-based tool.
- Tool was written in ERDAS Engine, National level constituency files were used for display on the map view with a MySQL database at the back-end responsible for holding results being fetched into it via an API from multiple polling stations across country.

## Software Engineer

[ 11/2010 – 6/2013 ]

- Worked as software engineer and implemented ERDAS Apollo 2010 for SUPARCO to handle cataloging issues of multiple satellite's remote sensing data. Developed solution served as a sound clip-zip-ship software and handled cataloging and ordering part at organizational as well as client level.

## Freelancer

[ 8/2016 – Current ]

- Actively working as a freelancer on Upwork ([Profile](#)) for last 9 years with 100% job satisfaction, over 80 Jobs & approx. 10k logged hours. Handful of projects are listed below:
  - *Food Hub*
    - An interactive web map with hundreds of US Census datasets. Features like Voronoi diagrams, cross walks etc. were the talking points that portal offered.
      - <http://52.38.47.239/TurfVoronoi/index.php>
  - *Omnia Digital Farming*
    - Omnia was developed, to tie together the newest technologies with expert insight to help growers improve their efficiency, productivity and profitability. By targeting agronomy at its core, Omnia makes it easier than ever for growers and agronomists to access and interpret their information to make management decisions.
      - <https://www.omniahub.co.uk>
  - *NetGen*
    - NETGEN delivers demonstration places for forestry information exchange and emphasizes the value of DNA and Co. in the forest. Healthy and stable forests are required for the forest to perform its many responsibilities. They include natural disaster prevention, timber production, biodiversity preservation, and drinking water and air filtration. The healthier a tree is, the better it adapts to the natural circumstances in its site.
      - <https://www.netgen.or.at/demoflaechen/>
  - *Silver Fern*
    - Farmer Rather than going through hectic manual process or including or excluding the fields, farmers would be able to do the same over a spatial map served on a web gis solution on the fly with only a few clicks of the mouse. A spatial database was designed to handle the requests of the farmers alongwith their own non spatial information embedded into the system.
      - <https://silverfernfarmers.co.nz>
  - *Kinemap*
    - Project involved allowing therapists to mark them self up on a map, reverse geocode their location and save their specialities for others to look for. Main page allowed a user to search for specific therapist and book their appointments. Openlayers was used as web mapping library, PostgreSQL for handling GIS data and MySQL for handling user database.
      - <http://kinemap.be/>
  - *Down Wind Fun*

- DownwindFun helps all watersport lovers to not only discover new downwind locations but also to share their favourite downwind locations with fellow downwinder enthusiasts all over the world. Project involved allowing users to either browse the available options or draw a new one them self up on a map. Openlayers was used as web mapping library, PostgreSQL for handling GIS data and MySQL for handling user database. Mapbox was used for 3d view of the browsed options.
  - <https://downwindfun.herokuapp.com/>
- Geo One Tech LLC
  - Website delivers information about the products, services and client base for the subject company in detailed and elaborative manner Link <https://www.geonetech.com/> Go Tech Portal Portal divides the information into multiple sub sections with customized layer panel allowing drag and drop, printing PDF based reports, drawing over the map and so on.
    - <https://www.gotechportal.com>

## EDUCATION AND TRAINING

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### MS RS & GIS

**Institute of Space Technology** [ 14/9/2020 – 12/4/2023 ]

City: Islamabad

Country: Pakistan

Website: [www.ist.edu.pk](http://www.ist.edu.pk)

Field(s) of study: Information and Communication Technologies

Final grade: 3.73

Thesis: Multi-Satellites Imagery Catalog

### BSc Software Engineering

**University of Engineering & Technology** [ 15/10/2005 – 3/8/2009 ]

City: Taxila

Country: Pakistan

Website: <https://web.uettaxila.edu.pk>

Field(s) of study: Information and Communication Technologies

Final grade: 81.75%

Thesis: Emergency Response System using WiMax Networks

## DIGITAL SKILLS

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Web developing (HTML, CSS, Bootstrap, JavaScript, jQuery, JSON, AJAX, PHP, MySQL) / Web Mapping (ArcGIS Online, PostgreSQL, PostGIS, OpenLayers, Leaflet, MapBox) / WEB DESIGN: HTML, SCSS, CSS, JAVASCRIPT, JQUERY, BOOTSTRAP, MATERIAL UI / GIS software: Expert QGIS and good control of ArcGIS / WebGIS Development / Node.js, ReactJS / Git / Python / Linux / HTML, PHP, Wordpress / Visual Studio, Visual Studio Code / Github / Docker, Docker-Compose / RESTful api / JSON / Geoserver (proficient) / MySQL RDBMS / OGR/GDAL / Visual Studio - Visual C# / PostgreSQL (+PostGIS) / Ant-design / Bootstrap / Web Development / API Integrations / Python FastAPI

## HONOURS AND AWARDS

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### NCA Distinguished Service Medal

National Command Authority [ 10/11/2021 ]

I was conferred upon NCA DSM (Distinguished Service Medal) for recognition of my services in the field of GIS development primarily Web based GIS applications. My 10 years long services were recognized along with the special 24/7 availability during the Covid-19 pandemic to deliver time sensitive project.

### Best Performance Award

SUPARCO [ 2013 ]

Awarded for individual best performance for the fiscal year 2013

## Team Performance Award

SUPARCO [ 2014 ]

Award was conferred to the team for developing an out of box complete GIS web app at country level.

## LANGUAGE SKILLS

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Mother tongue(s): **Panjabi; Punjabi**

**Other language(s):**

**Urdu**

**LISTENING C2 READING C2 WRITING C2**

**SPOKEN PRODUCTION C2 SPOKEN INTERACTION C2**

**English**

**LISTENING C2 READING C2 WRITING C2**

**SPOKEN PRODUCTION C2 SPOKEN INTERACTION C2**

*Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user*

## REFERENCES

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### **Dr. Bilal Aslam**

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