Muhammad Umair

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ABOUT ME

15+ years of full stack, GIS based development experience across multiple tech stack & frameworks. Self-driven, quick-learner, dependable, strong attention to details, enjoys working with open-source libraries, always eager to learn new technologies/skills along , having strong background in Geo-informatics & web based mapping solutions, passionate about creating innovative solutions for the management, analysis, and Geo-visualization of complex datasets.

WORK EXPERIENCE

3/2024 – CURRENT Aldermaston, United Kingdom
SOFTWARE DEVELOPER SPATIALDAYS LTD.

Working as full-stack developer primarily with front-end role on multiple projects:
Responsibilities include:
• Development & deployment of front-end portals using React ,Openlayers & Redux
• Back-end API development, deployment, integration and maintenance using Django & Docker
• Managing pipelines & various models responsible for remote sensing tech stacks using RasterIO, Numpy & Celery
• Maintain containerised environment for generic deployment using a combination of Docker, Kubernetees, CI/CD pipelines
• Design & develop front end using core Reactjs for accessing and evolving back-end API calls using JavaScript, usage of MaterialUI, Antd, Chartjs etc.
• Designing & choosing better tech stack & system architecture for a reliable service
• Managing & fixing any github issues, pull requests & deployments via git control of various repos

5/2023 – 11/2023
FULL STACK SOFTWARE DEVELOPER

Responsible for:
• Development of back-end APIs
• Design and deploy containerized back-end micro-services using FastAPI
• Architect back-end services, Non / spatial databases, docker containers & associated flow diagrams
• Core developer & member of tech team
• Handle and resolve JIRA tickets related to back-end development activities
• Optimized techniques for faster, secure and reliable docker containers performance
• Integrate spatial datasets into spatial databases
• Code, test and analyze Geo-spatial queries for spatial databases

11/2010 – 5/2023
FULL STACK / GIS DEVELOPER PAKISTAN SPACE & UPPER ATMOSPHERE RESEARCH COMISSION (SUPARCO)

• Lead developer responsible for planning & execution of projects from scratch till deployment on top of latest tech stack
• Development of techniques for faster rendering of Satellite Remote Sensing data over web based mapping applications built using open source tools/libraries
• Managing team of engineers & developers to ensure data consistency for Geo-spatial databases, processes and methods
• Build and develop tools or processes in conjunction with other engineering and product teams for the on-time, quality release of data products, services and applications
• Creating, managing, and troubleshooting services for developed products, associated datasets, services, features, and Geo-processing
• Assisting the management with strategic planning by researching and staying abreast of industry trends, marketplace solutions, and emerging technologies
• Diagnosing & troubleshooting complex system application issues, identifying, analyzing, and fixing bugs to fix performance issues
• Responsible for overlooking data center activities, management & security for highest availability, reliability and disaster recovery solutions

8/2009 – 10/2010
JR. SOFTWARE ENGINEER TRADEPOINT 360.

- Coding sub modules of a Tradepoint360 .Net POS Solution using C#, VB.Net and SQL Server
- Assisting development team across databases & code
- Debugging & error test developed modules for final integration
- Responsible to roll out knowledge base articles for users/clients
- CSR to handle complaints/issues tickets related to the point-of-sale solution
- Remote help & after sale customer support for the solution to clients

PROJECTS

1/2023 – CURRENT
Lead DevOps Engineer

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 Ban**k's Sindh Flood Emergency Rehabilitation Project (SFERP). Technical expert responsible for handling of development operations related to development, deployment and maintenance of the project.

8/2022 – 3/2023
Web GIS Expert

- 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.

4/2021 – 12/2022
SLMS Development Lead

- 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.

12/2020 – 4/2022
Web GIS Developer

- 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

1/2019 – 12/2022
GIS Developer

- 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

1/2019 – 12/2020
Online Satellite Imagery Service

- 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.

2/2018 – 3/2019
Web GIS R & D

- 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.

4/2012 – 12/2012
GIMINT Apollo Catalog

- 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.

9/2015 – 12/2016
Flood-watch Monitoring App

- 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) 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.

8/2012 – 12/2015
Web GIS Developer

- 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.

5/2011 – 4/2014
Web GIS Expert

- 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

9/2012 – 4/2013
Software Developer

- 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.

11/2010 – 6/2013
Software Engineer

- 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.

8/2016 – CURRENT
Freelancer

- 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://silverfernfarmer.co.nz
  - *Kinemap*
    - Project involved allowing therapists to mark them self up on a map, reverse geocode their location and save their speciliaties 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.geoonetech.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

14/9/2020 – 12/4/2023 Islamabad, Pakistan
MS RS & GIS Institute of Space Technology

Website www.ist.edu.pk │ **Field of study** Information and Communication Technologies │ **Final grade** 3.73 │

Thesis Multi-Satellites Imagery Catalog

15/10/2005 – 3/8/2009 Taxila, Pakistan
BSC SOFTWARE ENGINEERING University of Engineering & Technology

Website https://web.uettaxila.edu.pk │ **Field of study** Information and Communication Technologies │ **Final grade** 81.75% │

Thesis Emergency Response System using WiMax Networks

DIGITAL SKILLS

Databases

Relational databases │ PostgreSQL (+PostGIS) │ SQL (MSSQL, PL/SQL, MySQL)

Tools

Geoserver (proficient) │ Visual Studio, Visual Studio Code │ OGR/GDAL │ REST Client, SOAP, REST API │ GIS software: Expert QGIS and good control of ArcGIS │ Tools & Framework: Git, Jenkins, AWS, Bitbucket, Jmeter, Rest Assured, Postman, Shell │ Github │ Docker, Docker-Compose │ Visual Studio - Visual C# │ Windows Subsystem for Linux (WSL 1/2)

Frameworks

Full-stack development │ WebGIS Development │ JSON │ JavaScript │ Python │ Node.js, ReactJS │ API Integrations │ Fast-API │ Web Development (Python/Django) │ Queueing (Redis, Kafka, RabbitMQ, Django-RQ, Celery)

Operating Systems

Windows Servers 2003-2019 │ Linux

Libraries

Google Maps V3 JS API,OpenLayers, MapBox GLJS, Cesium, ArcGIS JS API │ Leaflet js │ MERN Stack (MongoDB, ExpressJS, ReactJS, NodeJS) │ Pandas, Numpy, Matplotlib, Rasterio, Pyshp, GeoJSON │ Git │ WEB DESIGN: HTML, SCSS, CSS, JAVASCRIPT, JQUERY, BOOTSTRAP, MATERIAL UI │ MapboxGL │ MaterialUi │ Ant-design

HONOURS AND AWARDS

10/11/2021
NCA Distinguished Service Medal – National Command Authority

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.

2013
Best Performance Award – SUPARCO

Awarded for individual best performance for the fiscal year 2013

2014
Team Performance Award – SUPARCO

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

LANGUAGE SKILLS

Mother tongue(s): **PANJABI; PUNJABI**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
URDU	C2	C2	C2	C2	C2
ENGLISH	C2	C2	C2	C2	C2

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

REFERENCES

Available on request