



## CONSULTANCY - TERMS OF REFERENCE

# Data Science/AI Researcher (QoS)

*Division: UNICEF Office of Innovation*

*Duration: 12 months*

*Duty Station: Barcelona, Spain*

### Advertising summary

We are seeking a highly skilled data scientist / AI researcher to join our team and support both our data infrastructure and the strategic Quality of Service (QoS) analysis project. The successful candidate will support the development of machine learning models to analyze QoS Time Series data and integrate, curate and maintain the relevant data sources and processing code. All these will help Giga achieve its goal of connecting every school to the internet.

---

### Child Safeguarding

Is this project/assignment considered as "Elevated Risk Role" from a child safeguarding perspective?  YES  NO

If YES, check all that apply:

**Direct contact role**  YES  NO

If yes, please indicate the number of hours/months of direct interpersonal contact with children, or work in their immediately physical proximity, with limited supervision by a more senior member of personnel:

**Child data role**  YES  NO

If yes, please indicate the number of hours/months of manipulating or transmitting personal-identifiable information of children (name, national ID, location data, photos):

**More information is available in the [Child Safeguarding SharePoint](#) and [Child Safeguarding FAQs and Updates](#)**

---

UNICEF works in some of the world's toughest places, to reach the world's most disadvantaged children. To save their lives. To defend their rights. To help them fulfill their potential.

Across 190 countries and territories, we work for every child, everywhere, every day, to build a better world for everyone.

And we never give up.

### **For every child...innovate**

UNICEF has a 70-year history of innovating for children. We believe that new approaches, partnerships and technologies that support realizing children's rights are critical to improving their lives.

The Office of Innovation is a creative, interactive, and agile team in UNICEF. We sit at a unique intersection, where an organization that works on huge global issues meets the start-up thinking, the technology, and the partners that turn this energy into scalable solutions.

### **About Giga**

Giga, a joint initiative between UNICEF and ITU, aims to connect every school in the world to the internet, addressing the global digital divide. Giga uses schools as anchor points to extend connectivity to surrounding communities, promoting economic growth and sustainability. Mapping school connectivity levels using machine learning and satellite images is the first step in identifying areas in need. So far, over 2.1 million schools in 136 countries have been mapped. Giga works with governments and private investors to secure funding and has already connected schools in 19 countries, including remote regions and refugee camps.

You can read more about Giga's work at <https://giga.global/> and by following us on X @Gigaglobal.

### **How can you make a difference?**

We seek a data scientist / AI researcher who can work with a diverse, global and interdisciplinary team to help us build and scale data infrastructure, tools and products that support the successful, on-the-ground implementation of the Giga project.

### **Your main responsibilities will be:**

- Curate and maintain a data infrastructure along with data processing code repository.
- Assess and identify new sources of data for Giga.
- Curate QoS training samples for ML model development.
- Develop, evaluate, run, and improve AI/ML models, with a special focus on Time Series Data.
- Analyze different datasets to generate new insights for Giga and its countries.
- Capture findings in appealing stories and documentation.

## Description of assignment

|   | Deliverables/Outputs              | Tasks  | Delivery deadline |
|---|-----------------------------------|--|-------------------|
| 1 | Geospatial database creation      | <ul style="list-style-type: none"> <li>• Create and curate a data infrastructure for geospatial datasets and other Giga relevant datasets. These must include: population, electric grid, terrain, elevation, smod, fibre, cell towers, coverage and poverty.</li> <li>• Create and open source repository for processing the geospatial data</li> </ul>   | Month 1           |
| 1 | Geospatial database creation      | <ul style="list-style-type: none"> <li>• Develop the necessary code to include QoS datasets, this must include: gigameter data, ISP data, ookla data, mlab data and isoc data</li> <li>• Develop the necessary code to include infrastructure data, this must include: fibre, cell towers (including opencellid) and coverage.</li> <li>• Datasets added to database and code added to the repository</li> </ul> | Month 2           |
| 2 | Geospatial database integration   | <ul style="list-style-type: none"> <li>• Provide support and develop the necessary code to integrate the database with the rest of the Giga infrastructure. All available datasets must exist in Azure blob container with folders: bronze, silver and gold, where bronze is raw data and gold is clean, ready-to-use data</li> <li>• APIs made available to access all datasets</li> </ul>                      | Month 3           |
| 3 | Geospatial database visualization | <ul style="list-style-type: none"> <li>• Develop a prototype of a tool to visualize all datasets on a map</li> <li>• The tool must allow the visualization of all the datasets on a map</li> </ul>   | Month 4           |
| 4 | QoS data exploration              | <ul style="list-style-type: none"> <li>• Download all publicly available data related to internet QoS. It must include at least 4 different public sources</li> <li>• Add to database and write code to process it</li> <li>• Provide documentation/report on all new datasets</li> </ul>  | Month 5           |

|    |  |  |          |
|----|--|--|----------|
| 5  | Academic engagement                                  | <ul style="list-style-type: none"> <li>• Help recruit and supervise master and PhD students in the context of QoS data analysis</li> <li>• Participate in 1-2 conferences/events</li> <li>• Write 1-2 scientific papers</li> </ul>   | Month 6  |
| 6  | Extend giga_ml_utils to Time Series data             | <ul style="list-style-type: none"> <li>• Extend our own ML library to be capable of dealing with Time Series data. At least feature processing, embeddings and forecasting capabilities.</li> <li>• Write python code (exhaustively documented) to implement it</li> </ul> | Month 7  |
| 7  | Explore technology prediction from QoS               | <ul style="list-style-type: none"> <li>• Exploration of QoS as means of predicting the technology in which a school is connected to the internet</li> <li>• Results on at least 4-5 countries on a final report</li> </ul>   | Month 8  |
| 8  | Explore prediction of internet outages from QoS data | <ul style="list-style-type: none"> <li>• Explore the capacity of using our own QoS data along with publicly available data to predict and/or forecast internet outages</li> <li>• Results on at least 4-5 countries on a final report</li> </ul>                           | Month 9  |
| 9  | QoS for advocacy                                     | <ul style="list-style-type: none"> <li>• Explore the use of QoS data (owned and public) to use for advocacy questions</li> <li>• Report of at least 3 potential questions and preliminary approaches</li> </ul>  | Month 10 |
| 9  | QoS for advocacy                                     | <ul style="list-style-type: none"> <li>• Develop 1 question from previous report and produce exploration code</li> <li>• Results on at least 4-5 countries on a final report</li> </ul>  | Month 11 |
| 10 | Handover   | <ul style="list-style-type: none"> <li>• Final handover report</li> </ul>  | Month 12 |

### To qualify as an advocate for every child you will have...

- A master's degree in computer science or related field. *\*A first University Degree in a relevant field combined with 2 additional years of professional experience may be accepted in lieu of an Advanced University Degree.*

- A minimum of five (5) years of relevant professional experience in Data Science and geospatial datasets.
- Strong experience with machine learning and data analysis using Python.
- Strong experience with algorithm development
- Experience with infrastructure data
- Excellent communication skills and ability to present complex technical concepts to a non-technical audience.
- Experience with cloud services, especially Azure ML
- Experienced and comfortable with remote team dynamics, process, and tools (Slack, Zoom, etc.)
- Developing country work experience and/or familiarity with emergency conditions is considered an asset.
- Fluency in English is required. Knowledge of another official UN language (Arabic, Chinese, French, Russian or Spanish) or a local language is an asset.

#### Travel:

- The consultant is expected to travel to Geneva one time (one trip), for a stay of 5 nights a month.
- The consultant is responsible for arranging his/her own travel, including visa and travel insurance.

#### Payment details and further considerations

Payment of professional fees will be based on the submission of agreed deliverables. UNICEF reserves the right to withhold payment in case the deliverables submitted are not up to the required standard or in case of delays in submitting the deliverables on the part of the consultant.

#### How to apply:

- Interest applicant is required to submit a financial proposal with all-inclusive fee. Please see the financial proposal template.
- Financial proposal must include travel costs (economy class) and daily subsistence allowance, if travel is required as per TOR and any other estimated costs: visa, travel/health insurance.
- **Applications without a financial proposal will not be considered.**

#### For every Child, you demonstrate...

UNICEF's values of Care, Respect, Integrity, Trust, Accountability, and Sustainability ([CRITAS](#)).

To view our competency framework, please visit [here](#).

UNICEF is here to serve the world's most disadvantaged children and our global workforce must reflect the diversity of those children. The UNICEF family is committed to include everyone, irrespective of their race/ethnicity, age, disability, gender identity, sexual orientation, religion, nationality, socio-economic background, or any other personal characteristic.

UNICEF offers reasonable accommodation for consultants/individual contractors with disabilities. This may include, for example, accessible software, travel assistance for missions or personal attendants. We encourage you to disclose your disability during your application in case you need reasonable accommodation during the selection process and afterwards in your assignment.

UNICEF has a zero-tolerance policy on conduct that is incompatible with the aims and objectives of the United Nations and UNICEF, including sexual exploitation and abuse, sexual harassment, abuse of authority and discrimination. UNICEF also adheres to strict child safeguarding principles. All selected candidates will be expected to adhere to these standards and principles and will therefore undergo rigorous reference and background checks. Background checks will include the verification of academic credential(s) and employment history. Selected candidates may be required to provide additional information to conduct a background check.

**Remarks:**

Only shortlisted candidates will be contacted and advance to the next stage of the selection process.

Individuals engaged under a consultancy or individual contract will not be considered "staff members" under the Staff Regulations and Rules of the United Nations and UNICEF's policies and procedures, and will not be entitled to benefits provided therein (such as leave entitlements and medical insurance coverage). Their conditions of service will be governed by their contract and the General Conditions of Contracts for the Services of Consultants and Individual Contractors. Consultants and individual contractors are responsible for determining their tax liabilities and for the payment of any taxes and/or duties, in accordance with local or other applicable laws.

The selected candidate is solely responsible to ensure that the visa (applicable) and health insurance required to perform the duties of the contract are valid for the entire period of the contract. Selected candidates are subject to confirmation of fully-vaccinated status against SARS-CoV-2 (Covid-19) with a World Health Organization (WHO)-endorsed vaccine, which must be met prior to taking up the assignment. It does not apply to consultants who will work remotely and are not expected to work on or visit UNICEF premises, programme delivery locations or directly interact with communities UNICEF works with, nor to travel to perform functions for UNICEF for the duration of their consultancy contracts.