

Request for Proposals: Amazon Web Services (AWS) Web Development & Bioinformatics Consultant

Overview:

The Foundation for Food & Agriculture Research (FFAR) is seeking a consultant to create seamless web interfaces for uploading data and trained models in AWS, while also establishing environments and dashboards for efficient model testing and execution. Additionally, the consultant will prepare datasets for model validation. This consultancy could consist of an individual or team of experts.

Background:

Pioneered by the [Foundation for Food & Agriculture Research](#) (FFAR) and the [Global Alliance for Improved Nutrition](#) (GAIN), the [Harvest for Health Initiative](#) aims to accelerate the development of underutilized crops and to increase the diversity of nutritious foods in the marketplace. While underutilized crops have incredible functional and nutritional potential, the development of such crops for consumption or use in other products is prohibitively expensive and time intensive. To attract more private sector investment in underutilized crop development, Harvest for Health launched the [Breakthrough Crop Challenge](#) to develop a predictive model that can screen underutilized crops to determine a crop's potential as a source of functional ingredients or nutrients. The predictive model input data must either use genome sequencing data, nutrition composition, or biochemical properties of crop data. Data must be publicly available or made publicly available at the time of submission of the model. The Breakthrough Crop Challenge is requesting a developed and validated predictive model to identify underutilized crops with market potential as a source of ingredients with one or more of the following functional properties:

- Thickeners, emulsifiers and stabilizers
- Bulking agents
- Taste and flavor enhancers
- High nutrient density, please specify the targeted nutrient(s)

After applicants submit predictive models, FFAR will validate the model as well as test the presence of the selected functionality in selected crops. The consultant will help to build the submission portal to receive the predictive models, execute the models, generate reports on model performance, and compile a data set for FFAR's interval validation of the models. Details of this role are stated in the scope of work.

Scope of Work:

1. Web Interface Development:

- Design and develop user-friendly web interfaces to facilitate the seamless uploading of data and trained models to AWS.
- Ensure smooth integration with AWS services for secure and efficient data transfer and storage.
- Collaborate with FFAR Communications to ensure alignment with FFAR branding and FFAR voice.
- Provide FFAR Communications with all outward-facing materials (database/platform, copy, branding, etc.) for review before finalization and publication.

2. Bioinformatics Model Setup:

- Understand requirements for model setup and execution from provided documentation and design workflows on AWS to fulfill the need of computing resources.
- Configure environments on AWS to accommodate uploaded predictive models.
- Implement protocols for testing and validation of models within the AWS environment.
- Compile universal datasets for testing and validating different models with best practices to prevent data leaks.

3. Dashboard and Report Creation:

- Develop interactive dashboards to monitor and manage data, models, and execution processes.
- Customize dashboards to provide insights into model performance and analysis results.
- Generate model performance and analysis reports to support downstream decision-making.

Deliverables:

- A functional submission portal interface.
- A clean validation database using publicly available data. Data types include genomic sequencing, nutrition composition, and biochemical properties of crops.

- Predictive model performance reports.
- Guidelines/protocols for running predictive models.
- Guidelines for interpreting the predictive model output.

Timeline:

It is anticipated that this consultancy will begin in September 2024 for a duration of 6-8 months. Deliverables will be due at different times as agreed upon by FFAR and the consultant(s).

Qualifications:

- Bachelor's or Master's degree in Computer Science, Bioinformatics, or a related field.
- Proficiency in web development technologies and modern frameworks (e.g. HTML, CSS, JavaScript, Python web packages, Docker).
- Strong understanding of AWS services, particularly for data storage, computation, and deployment (e.g., S3, EC2, Lambda).
- Experience with dashboard development and visualization tools (e.g., D3.js, Plotly).
- Knowledge of bioinformatics concepts and tools, including modeling and biological data analysis, and genomic data preferred.
- Ability to collaborate effectively with multidisciplinary teams and communicate technical concepts clearly to non-tech stakeholders.

Organizational Arrangements

FFAR’s scientific program director, Constance Gewa, will be the primary internal point of contact for this consultancy. The scientific program director will establish with the consultant(s) a schedule for periodic check-ins to answer questions and provide any necessary guidance.

Submitting a proposal

Proposals should be submitted in PDF format and are due for submission by 5:00 pm Eastern time on June 28, 2024. Proposals should be emailed to Constance Gewa at H4H@foundationfar.org and should contain:

- Consultant or organizational background/overview,
- 2-3 page concept note on your approach to meeting the scope of work,
- Experience related to web interface development, bioinformatics model set-up, database compilation and dashboard development and visualization tools,
- Project plan and timeline,
- Budget and budget justification,
- Resume(s),
- Key personnel, roles and responsibilities, and

- 2-3 past projects and client references.

FFAR will hold presentations and discussions with shortlisted consultant(s) beginning the week of July 15, 2024. The final consultant(s) will be selected by August 15, 2024.