

Terms of Reference

Speech Technology Developer – Pulse Lab Kampala

I. Position Information

Title: Speech Technology Developer – Pulse Lab Kampala

Type of contract: IC National

Duty Station: Kampala

Start Date: immediately

Duration of assignment: The contract will be effective from date of signing with a duration of 11 months

II. Background and rationale

Global Pulse (<http://www.unglobalpulse.org/about-new>) is an innovation initiative of the United Nations Secretary-General on Big Data. Its vision is a future in which big data is harnessed safely and responsibly as a public good. Its mission is to accelerate discovery, development and scaled adoption of big data innovation for sustainable development and humanitarian action. Global Pulse is building a catalytic network of in-country innovation centers, which will test new tools, data and analysis, share what lessons with the global community, mainstream successful approaches for real-time impact monitoring into policymaking. The first Lab has been established in New York (Pulse Lab New York) followed by Jakarta, Indonesia and Kampala, Uganda.

Pulse Lab Kampala (<http://www.unglobalpulse.org/kampala>) is an inter-agency initiative of the United Nations under the Office of the Resident Coordinator in Uganda. The first of its kind in Africa, it brings together researchers from Government, the UN, non-governmental organizations and private sector to explore the utility of new sources of digital “Big Data” (such as social media, mobile data, online information) and real-time analysis techniques for social development monitoring and program planning.

A data revolution is underway in Uganda and in Africa. There is more data now than ever. New technologies are leading to an exponential increase in the volume and types of data available, creating unprecedented possibilities for informing and transforming society and protecting the environment. There is more data produced in the last 2 years than in all of human history. There is a tremendous potential in new technology; indeed, this is the forefront of the data revolution already well underway in the private sector. The new SDGs agenda will have increased demands – and opportunities- for the use of data. Pulse Lab Kampala supports the UN Country team to tap into the revolution obtaining more and better data to support development work and humanitarian action supporting:

1. Enhance Early Warning: Detection of anomalous trends and patterns of events enables early warning of emerging crises and earlier responses to prevent long-term harm;
2. Real-Time Awareness: An up-to-date picture of trends, hotspots and dynamic changes in population behaviour enhances programme planning and monitoring of implementation and
3. Rapid Impact Monitoring and Evaluation: Timely feedback on the impact of programmes and policies allows for adaptive course correction and accelerated achievement of results.

Radio is a vibrant medium for public discussion in Uganda. Variety shows and phone-ins hosted by community radio stations are popular ways for Ugandans to voice their needs, concerns and opinions, particularly in rural areas. By using technology to capture audio and transcribe the content into text, radio can become a digital big data source. Pulse Lab Kampala is working closely with Stellenbosch and Makerere Universities to develop the technology to conduct radio mining in Uganda. The project will capture radio audio in Ugandan English, Acholi and Luganda and transcribe the content into text. Pulse Lab Kampala is currently analysing around 40 stations in Kampala and will soon expand to other locations in Uganda. Speech recognition pronunciation dictionaries, and language and acoustic models are under development. Details on the project are available at: <http://pulselabkampala.ug/radiomining/>

Under the guidance of the Pulse Lab Kampala Data Scientist, the consultant will help to set up a speech recognition system for deployment of radio mining in Uganda. This system will be based on open source speech software, and will take radio recordings in Ugandan English, Luganda and Acholi as input and produce text transcripts.

III. Description of the assignment

The consultant will carry out the following steps:

1. Set up a working installation of a speech recognition system, based on available open source software (for example HTK and Kaldi).
2. Extend the system to allow for ongoing adaptation of speech models, given training data, and refinement of accuracy;
3. Assist with the development of vocabulary lists and pronunciation dictionaries for Ugandan languages;
4. Deploy the speech recognition system on a cloud server, such that it is possible to take several radio recordings, split them up into batches, and process each batch.
5. Provide ongoing upgrades to the server-based speech recognition system to support the needs of the radio mining project.

IV. Methodology

- a) The expert is expected to work in close consultation with the Data Scientist at Pulse Lab Kampala;
- b) Technical advice will be available from collaborators at Stellenbosch University;
- c) The expert will work with the team at Pulse Lab Kampala;
- d) Copyright and ownership - all materials produced and other intellectual property will be solely owned by Pulse Lab Kampala. Any material provided to the expert will remain the property of Pulse Lab Kampala.

V. Expected deliverables

Deliverables / Outputs	Estimated Duration to complete the assignment	Review and Approvals Required
Set up a working speech recognition system installation using existing language models.	August – September 2015	Data Scientist
Extend the system for speech model adaptation to Ugandan languages and refined performance.	October- December 2015	Data Scientist
Assist with the creation of vocabulary lists and pronunciation dictionaries.	January 2016-April 2016	Data Scientist
Deployment on cloud server and ongoing development to support radio mining analysis.	May 2016- July 2016	Data Scientist

VI. Duration

The contract will be effective from date of signing with a duration of 11 months

VII. Working arrangements

Institutional Arrangement

- The consultant will report to Pulse Lab Kampala Data Scientist on a regular basis on the progress in line with the set deliverables of the assignment;
- e) The consultant will liaise, interact, collaborate/meet staff at Pulse Lab Kampala and partners;
- UNDP (Pulse Lab Kampala) will support the consultant in the following:
 - Access to all reports and data relevant to the assignment. These will include donor reports, project documents and donor reports;
 - Support and assistance to gain access to relevant stakeholders for consultations to the extent possible.

VIII. Duty Station

Kampala

<p>IX. Requirements on skills, competencies, education and experience</p> <p>Competencies</p> <ul style="list-style-type: none"> - Plans and produces quality results to meet established goals; - Generates innovative, practical solutions to challenging situations; - Demonstrates substantive and technical knowledge to meet responsibilities and post requirements with excellence; - Demonstrates openness to change and ability to manage complexities; - Responds positively to critical feedback and differing points of view. <p>Education</p> <ul style="list-style-type: none"> - Bachelors degree in Computer Science, Software Engineering or related field. <p>Experience</p> <ul style="list-style-type: none"> - Working knowledge of various programming languages and experience with software development. Experience with Python is an advantage. - Experience of software development and deployment on cloud servers. - Familiarity with the operation of speech recognition software. <p>Core skills</p> <ul style="list-style-type: none"> - Ability to conceptualize, plan and execute innovative ideas. - Displays open, co-operative behavior with other team members; - Remains calm and in control, and good humoured even under pressure; - Responds positively to critical feedback and differing points of view; - Sets priorities, produces quality outputs, - Meets deadlines and manages time efficiently. - Excellent oral and written skills. <p>Language Requirements Excellent command of English.</p>
<p>X. Evaluation method and criteria</p> <p>The award of the contract shall be made to the individual consultant whose offer has been evaluated and determined as:</p> <ul style="list-style-type: none"> - Responsive/compliant/acceptable, and - Highest Combined Score (based on the 70% technical offer and 30% price weight distribution) where the minimum passing scores of technical proposal is 70%. <p><u>Technical Proposal (Maximum 70 points):</u></p> <ol style="list-style-type: none"> 1. Interpretation of the assignment and methodology- 35 points 2. Relevance of experience (professional/work experience)- 35 points <p><u>Financial Proposal (Maximum 30 points)</u> To be computed as a ratio of the Proposal's offer to the lowest price among the proposals received by UNDP. Short-listed candidates may be requested to participate in an interview with the selection panel.</p>
<p>XI. Payments</p> <p>4 payments (25% of lumpsum each) will be done upon completion and delivery of deliverables indicated in section V.</p>
<p>XI. Application procedure</p> <p>The consultant is required to upload an electronic application in one single PDF on the jobs website not later than July 13th, 2015. The application should include the following documents/information:</p> <ul style="list-style-type: none"> - Duly accomplished Letter of Confirmation of Interest and Availability using the template provided by UNDP (see Annex II); - Updated Personal CV highlighting past experience in similar assignments and with 3 professional references with contact details (email and telephone); - Technical proposal (1/2 page maximum); - Financial proposal (in template provided in Annex II) stating an all-inclusive fixed lump sum fee for this assignment in Ugandan

XI. Application procedure
<p>shillings, supported by a breakdown of costs. Such total lump sum price must include professional fee, and costs necessary to conduct the assignment such as communication costs, etc. The consultant will be paid against the completion of specific, measurable deliverables as identified in this TOR.</p> <p>Please note that applications received after the deadline will not be considered. For any further clarifications; please contact; justine.naiga-bagonza@undp.org; fredah.zawedde@undp.org and diana.nabbanja@undp.org.</p>
XII. Annexes
<p>Annex I: Individual Contractor General Terms and Conditions</p> <p>Annex II: Template to Confirmation of Interest and Availability and Submit the Financial Proposal</p>