CALL FOR APPLICATIONS FOR MASTERS SCHOLARSHIP UNDER THE AdEMNEA Project

Msc. Topic 1: IoT-based Weather Monitoring Work Package 2: TASK 2.4

Background

Adaptive Environmental Monitoring Networks for East Africa (AdEMNEsA) Project is a combined research and capacity development project funded by the Norwegian Agency for Development Cooperation, (Norad) under the Norwegian Programme for Capacity Development in Higher Education and Research for Development (NORHED II). It is a cooperation between Norwegian University of Science and Technology, NTNU (leading institution), Makerere University in Uganda (leading southern institution), the University of Juba in South Sudan, Dar es Salaam Institute of Technology (DIT) in Tanzania and University of Bergen, Norway.

This project will design, develop, and deploy a flexible network of data gathering and monitoring stations for meteorological data as well as a wide variety of data including audio, image, and video data as well as field reports and telemetry data, integrating both existing sensing platforms and customized components for specific research areas. This is targeting the thematic sub-area Climate Change and Natural Resources. These data points will be aggregated through resilient and energy-efficient ICT networks from the field to researchers conducting data analysis using machine learning, pattern recognition, and other artificial intelligence and analytical methods in order to support researchers in the application domain.

The targeted application domains will be weather monitoring, building on the results and infrastructure established in the NORHED WIMEA-ICT project, and using this data together with the additional sensing and measurement sources to support researchers initially in the entomology domain. Both weather monitoring and the direct analysis of the presence, prevalence, and behaviour of pollinators and pests will offer important insights into the effects of climate change on natural resources for both the natural environment and particularly agriculture.

Weather parameter such as temperature, relative humidity, precipitation, and wind influence the abundance and diversity of terrestrial insects, and this may be reflected in their distribution, phenology, and activity. This is because the survival, development, fecundity, and behaviour of individual insects, and thus their population dynamics are strongly influenced by weather. This study aims to build a weather monitoring module which will be part of various Internet-of-Things (IoT) autonomous systems that collect data on the health, behaviour and diversity of key insect pollinators and pests in East Africa. It is expected that such systems will integrate a system on a chip board, with

an array of sensors, reliable and alternative uplinks, centralized data storage, and a monitoring and visualization tool. Therefore, the work will involve development of the hardware for sensor nodes and the gateway, algorithms for transmission power control, data dimensionality reduction and gateway synchronization, and a data representation tool.

Requirements

- An undergraduate degree in Electrical/Telecommunications/Computer/Software Engineering, or Computer Science with a CGPA of at least 4.0 on a scale of 5.0

Desirable Skills

- IoT networks and device development
- Good coding skills

Scholarships Available for **12 months** after signing of the contract

Key activities

The candidate will be required to do the following: -

1. Participate in research activities, leading to the design of a weather station
2. Participate in the lab activities including seminars, workshops

a) Participate in preparing of manuscripts

3. Participate in the Field work for maintenance and deployment of automatic weather stations

Funding

1. The successful Master candidates will receive in addition to Full Tuition and Functional Fees at Makerere University, a living allowance of 3,600 NOK (approx. 400 USD) every month for a period of two years.
2. The successful Masters candidates will be offered entitled to attend workshops, seminars, conferences, facilitation for field study, printing of thesis, publication among others.

Admission requirements

The applicant must be admitted to MAK in any of the above-mentioned disciplines. The list of requirements is as follows:

b) The candidate must hold a Bachelor's degree in a relevant field and possess competence in areas relevant to the position.
c) The applicant **MUST** have completed their first year of study and is ready to embark on their research and be ready to complete within 12 months
d) The candidate must be willing to sign a contract that commits him/her to work at MAK for at least a year on completion of their studies if offered the opportunity.

e) With the applicant's permission, MAK may also conduct a reference check before appointment.
f) All qualified persons are encouraged to apply for the fellowship, irrespective of cultural background, gender, age or disability.
g) Women are encouraged to apply.
h) Applicants should submit their application and CV by *email to admnea@cit.ac.ug with a copy to stephen.wolthusen@ntnu.no and sansa@cit.ac.ug*. The subject of the email should specify the text "SCHOLARSHIP APPLICATION". The following documentation should be submitted as attachments to the application:
i) Certificates and/or grades for all post-secondary education, up to and including the bachelor's level;
j) A Masters concept aligning with one (or more) of the above described areas of foci. The concept must be no more than 2 pages including the bibliography (font size 12pt, margin 1-inch, single line spacing). The concept should include a presentation of possible research questions/hypotheses, objectives and justification. An essential part of the assessment of applicants is the quality of the concept. Please check the link at https://www.ademneaproject.net/workpackages-wp2 , "**Task 2.4 Sensor Gateway and Weather Parameters**" for the description of each area of study.

The applicant is fully responsible for submitting complete documentation. Without complete documentation we cannot, unfortunately, include the applicant in the assessment process.

Closing date: 11th July 2025 at GMT.

For further information please contact:

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PS: Only *Short-listed applicants will be invited for interviews.*