Software Engineering Project (SEP) Competition

Smart Animal Farming Management Systems (SAM)

Competition Rules

1. Only **IEEE UAE** Students Members are eligible for this competition.
2. Each institution can submit a maximum of two entries in this competition.
3. Each competing team shall have no more than three students.
4. The contestants shall not use any unauthorized or unlicensed software.
5. The source code and all relevant documentation shall be made available to the competition coordinator and the judges on the day of the competition.
6. Salient features of the software shall be documented with the aid of an A1 size Poster. A brief user manual shall also be provided

Abstract

Smart Farming represents the application that integrates modern ICT devices into agriculture domains that leads to the revolutionary of agriculture activities. The smart farming application leverages on emerging ICT technologies such as precision equipment, sensors, GPS-positioning systems, data stores such as a database, Internet,... etc. in order to automate many activities taken by humans.

Smart Farming has a great potential to bring agriculture to a more productive and sustainable agricultural production, based on a more precise and resource-efficient approach. This approach should provide farmers with added values of better decision-making and more efficient way to perform farming operations and management.

In line with the idea above, University of Dubai (**UD**) is proposing a project called Smart Animal Farming Management Systems (**SAM**)

The main objective of **SAM** is to help farmers increase the farming operation efficiency by collecting effective data from their live animals (e.g., horse, camel, cow, cattle, eagle, lamb etc.). Furthermore, efficient farming operations can be in other forms of effective farming operations such as efficient use of environmental resources (e.g., water, organic treatments, animal feeds etc.) or also reducing of manual human activities.

Besides collecting effective environment inputs, **SAM** should also include decision support modules that facilities better decision-making process. **SAM** should demonstrate analysis ability that is based on data collected from any emerging technology devices. In summary, the system should be able to do the following:

1. Capture real live data from the animal in farm using sensors.
2. Provide options for the user to visualize the captured real-time data based on more than one visualization techniques (e.g. dashboard Portal with data charts).
3. Decision-making module that helps the farmer makes a better decision.
4. Any additional functionality that contributes to smart animal farming activities.

Functionality

- Does the application able to capture real-time input from a live animal?
- Does the application generate acceptable visualization?
- Does the application support achieve better economic values?
- Does the application support decision making process?
- How long it takes for the software to analyze data and proposed solutions?
- How practical is the application? In term of using it to support farming activities.

Theoretical Knowledge

- Can the student explain the smart farming problem?
- Can the students show sufficient understanding of efficient smart farming operation concepts?
- Can the students show sufficient understanding of the methodology and designing process they used for implementing their application?
- Did the students identify and understand advantages and disadvantages of their developed application?
- Can the students demonstrate an understanding of how they can extend the system functionalities and overcome the limitations in future work?

Examples for sensors

1. Animal health monitoring Sensors, or any technologies for producing an accurate health status and disease diagnosis are applicable. For example, Heartbeat, Muscle Sensors, etc..

2. Agricultures Sensors such as Soil moisture, leaf wetness.

3.Environment Sensors such as temperature, humidity, Fire detections etc...

Example for Decision making process

include software algorithms to automate actions in real time based on the Sensed values. such as turning on water pump, calling emergency to stop fire, alerts to avoid animal from racing session because of its health status, etc..

User-Friendly Interface

What is the users' perception of the developed software? (clear interface, menu options, and appropriate visual elements)

- Is the application easy to use by users with no computing background?

- Is the application user-friendly for visualizing data, and how fast and practical is it to support decision making?

Poster and User Manual

The students are required to provide:

- A brief user manual.
- An A1 size poster to provide a concise software description, and depict the technical specifications/methodology /tools/techniques used in the development of the software.
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Testing Procedure

Student teams will be asked to demonstrate their software. Each team will demonstrate their software using a sample input of their own.The input data should be captured using sensors attached to a live animal. The software should be able to provide more than one visualization options and support farmers with at least one decision making modules.

The judges will test the software in a way that is uniform for all teams. The judges will also ask questions concerning the theoretical knowledge related to the developed software and its user interface. They will also evaluate the poster and the brief user manual. Each team will be then given 15 minutes to explain and demonstrate their software according to the given specifications. Additional features, if they exist, will be evaluated too. The additional features should be related to promoting/supporting smart farming activities.

	Evaluation Criteria	**Mark**	**Judge 1**	**Judge 2**	**Judge 3**	**Average** $\frac{J1+J2+J3}{3}$
1	Functionality	**50**				
2	Theoretical Knowledge	**15**				

3	User-friendly interface	**15**				
4	Additional features	**10**				
5	Poster & User manual	**10**				
	Total Marks					