

## Development of a Wireless Sensor Network based automated feed uptake and animal development monitoring scheme for semi-rural dairy operations.



Automated Fluid Uptake Kiosk

### Project Profile

The project is relevant to the automation of dairy operations across India since it introduces a desirable independence from manual mistake-prone monitoring of animal feed uptake and allows for development monitoring (weight and girth) while the animal is on the move. It is specially applicable to dairy farms with a large number of animals and less man-power.

### Project Objectives

Primarily, in large dairy operations, there is a constant concern about the monitoring of feed uptake by animals, monitoring of development parameters of the animal such as width/height/weight, detection of animal feeding and milking profile so as to optimize milk let-down on an individual animal basis across large animal populations. On a secondary level, in developing countries, there is a requirement to constantly monitor animal feeding profiles due to the possibility of pilferage and waste which may lead to reduced animal growth. There is also a need to log and monitor the animal milking cycle to improve yield. As a solution to

this problem, a wireless sensing network is designed and developed with sensors for animal weight and proximity and identity detection which are attached at several nodes to monitor and centrally log the feed uptake and record development in cattle in-line on a continuous basis in large semi-rural dairy farms.

The following sub-objectives are targeted:

- a) a centralized inventory of cattle feed can be maintained
- b) feed patterns and feed time preferences of individual animals can be logged and used to optimize nutrient delivery
- c) in milch cattle, milking and feeding profiles along with feeding-to milking cycle times can be logged and engineered to increase yield

### Milestones

The following major milestones in the development of the project have been achieved:

- a) Development and testing of first prototype wireless sensor network
- b) Development of wireless sensor network with nutrient plus weight sensor
- c) Development of camera with WSN for animal dimension measurements



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Weight Measurements System

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Feed Augur (*representative image*)