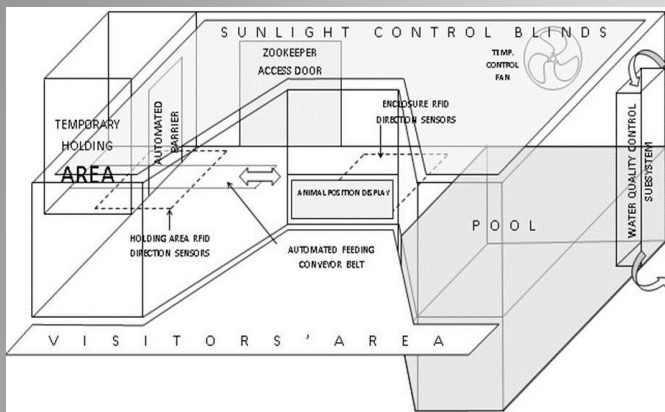


ONE PAGE SUMMARY SMART ANIMAL ENCLOSURE



FACULTY OF ENGINEERING

At zoos located in tropical countries like Singapore, the enclosures housing animals in captivity play a critical role in their well-being. However, automated features are lacking in existing enclosure designs. Proper environmental conditions such as suitable levels of sunlight and temperature, as well as the availability of clean water, are important as they assume the role of the natural habitat for animals, especially those originating from another climate e.g. polar bears.

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SMART ANIMAL ENCLOSURE

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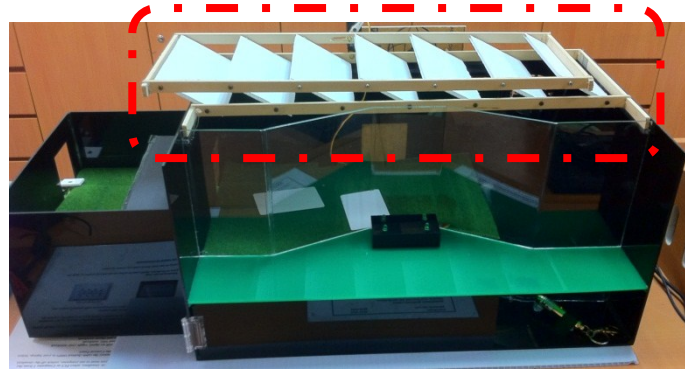
TEAM 3 - 5

Smart Animal Enclosure System consists of 5 main sub-systems:

Climate Control System

To ensure flexibility of the design, parameters of the system are adjustable depending on the needs of different animals.

- Temperature sensor to adjust the direction of the fan to either blow in / out of the enclosure
- Sunlight control system is required to simulate conditions of the animals' natural habitat via the blinds



Water Regulation System

While cleanliness of water is important for the animals' hygiene, we have considered the need for water conservation in the local context.

- Water quality monitoring system is incorporated to maintain cleanliness
- When it is dirty, it will be pumped out through a filtering system so as to use recycled clean water
- Water level indicators is installed to ensure optimal level is being reached and water level would not reach too high or too low a level when the animal is in the pool



Maintenance Control System

Implementation of a passcode access system for entry by zookeepers, for purposes such as routine maintenance, allows for restriction to authorized personnel and tracking access logs.

- The safety of the zookeeper is assisted by having the synchronized automated feeding process that quarantines the animals in a designated holding area before any entry
- Authorised user will be allowed to change the password via the security system for enhance security
- In the event of a security breach, the system is linked up to a GUI program that is being monitored by the control room

Automated Feeding System

The automated feeding system is able to provide a ready supply of fresh food to the animals, and will allow monitoring of feeding patterns.

- It also works in conjunction with the access control system to bait the animals to the holding area before the zookeeper's entry
- Minimise the contact between the animal and the zookeeper which will thus prevent mauling incidents from happening

Animal Detection System

Conventional zoo enclosures only have a simple static information panel for visitors to read.

- By utilizing RFID readers to detect movements of tagged animals, the data can be processed to display the position of specific animals on the panel
- Increasing the visitors' interest.
- A similar system is utilized in the maintenance control subsystem to determine whether all animals have entered the designated holding area before allowing maintenance to be carried out