Case Study A-19: TPCS: Triassic Park Control System

As you may be aware, John Hammond, the billionaire entrepreneur, had a vision of creating a wildlife park stocked with cloned dinosaurs, which was to be known as "Jurassic Park". Unfortunately, the project to create this park came to grief, largely because of failures of the computer control system (as well as deliberate sabotage by the software designer). As a result, the dinosaurs escaped from their compound and ate several of the park's employees.

However, a few dinosaur embryos were kept in cold storage, and John Hammond's grandson, Timothy, is willing to make another attempt at the project, provided the problems with the computer control system can be overcome. His initial statement of requirements is given below.

TRIASSIC PARK CONTROL SYSTEM (TPCS)

The computer system must monitor the movements of all dinosaurs in the park at all times, as well as the movements of Muldoon the game warden, and the electric vehicle which transports tourists along a set route through the park past all the dinosaur enclosures.

Each dinosaur will be fitted with a small radio transmitter, which will emit a signal at frequent intervals. The signals will be picked up by three receivers, which will relay to the central computer the direction from which each signal from each dinosaur was received. The central computer will analyse these signals in order to calculate the position of each dinosaur.

Muldoon and the tourist transport vehicle will each carry a similar transmitter.

The pens enclosing each species of dinosaur will be surrounded by electric fences to prevent them from straying into one another's areas, or onto the road used by the tourist transport. The computer must detect any damage to any of these fences, and raise an alarm. An alarm must also be raised if any dinosaur strays out of its enclosure, or if the tourist transport remains in one place for too long, or if it is turned over by a *tyrannosaurus rex*, or trodden on by a *brontosaurus*.

Muldoon will drive around the park in a jeep which is able to go anywhere in the park (not only along the tourist path). A monitor screen in Muldoon's vehicle will be linked by radio to the computer, and will display the positions of all the dinosaurs and the tourist vehicle. All alarms will also be sent to Muldoon's monitor, and Muldoon must also be warned if any dinosaur is close to him, or to the tourists, and told what species it is.

The system must be easy for the untrained staff in the control centre to use. It must automatically "bleep" Dr. Harding the vet if any dinosaur is injured, or alert Dr. Grant the dinosaur behaviour expert if the tourist transport is surrounded by a pack of *velociraptors*. The system must be ready for the planned opening of the park next June, and must not cost more than the annual food bill for a *stegosaurus*.

End of Description of Proposed TPCS