The Black Sheep Team Description

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This short paper describes the functionality of the Robocup Rescue agents built by Team Black Sheep[1] at the University of Auckland[2]. We have implemented agents for each of the four components of the simulated environment: fire brigades, police forces, ambulance teams and emergency centers (fire stations, police offices and ambulance bases).

Our mobile agents are called Fireman Sam[3], PC Plod and Dr Ropata[4]

All our agent implementations share a common communication protocol. Messages are encoded using a set of message types, a timestamp and zero or more bytes of message-dependant data. Messages are packed into 80-byte chunks, up to four of which are sent to the kernal.

We have implemented (or are implementing) four different strategies.

Trivial Fire brigades and ambulance teams can request help from police to clear roads, but otherwise each agent is entirely independent. Agents simply pick the closest job that needs doing and attempt to plan a path, requesting for any blocked roads along the path to be cleared. If path planning fails then a new job is chosen. PC Plod will clear requested roads first. Emergency centers pass on the road-clearing requests but do nothing else.

Simple This strategy is an extension of the trivial strategy. Agents can now report fires, blocked roads and buried civilians to each other. Centers pass these reports on to the relevant agents. Agents also report their current position and when they have no valid targets. Centers will assign jobs to idle agents.

Clustering Buildings are divided into city blocks and fires are assigned a priority according to how fiery the block is as a whole. If a city block is mostly on fire then buildings in that block are low priority, if the block is mostly safe then any fires nearby are higher priority. The spread of fires from block to block is thus minimised.

Auction The auction strategy is a centralised scheme. Emergency centers maintain information about the jobs that need doing by listening for reports from agents. When a new job becomes available the center asks for bids from the agents and assign the job to the highest bidder. This mechanism is still being implemented and how best to generate bids remains to be seen.

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1 http://www.cs.auckland.ac.nz/~rescue
2 http://www.auckland.ac.nz
3 http://www.firemansam.co.uk
4 http://www.filmarchive.org.nz/collections/collections_images.html