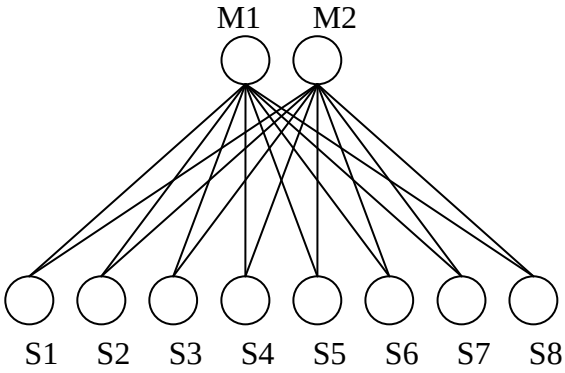
Tutorial 12:
Robotics

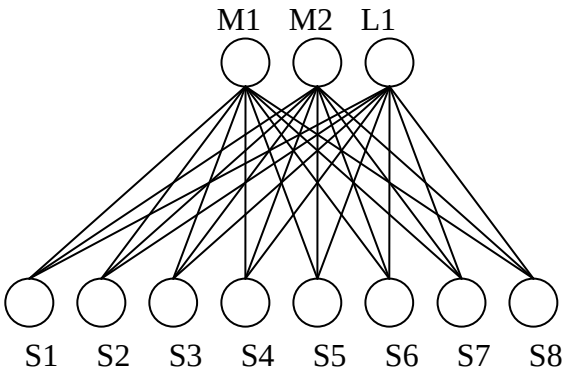
Question 1

a)
8 infrared sensor inputs (S1-8), 2 motor outputs (M1-2)
Fully connected



b)
A mechanism for recombining the neural networks could be choosing two ‘parent’ networks and combining the weights of these two networks (half from one parent, and half from another.
The weights could also be mutated to allow better solutions to be found.

c)
Adding the light to the network (output L1)
[Assume that the existing sensors will be able to detect the lights of other robots.]



d)
The types of signalling could be for the robots to turn on their lights when they are at or near the charger. Other agents could use this to find the charger.
Alternatively, the robots could signal when they are far away from the charger, in this case the other agents would avoid the lights when they are looking for the charger.
[Issues for discussion: altruism, reciprocal altruism, cheating]

Question 2

C-3PO

a) Technical abilities:
Walking, language (speech recognition, speaking, understanding many languages), vision (face recognition) …

b) Generally interacted successfully with humans and other creatures (although not always well with bad guys)
Success was mostly due to C-3PO's language ability

c) Not clear whether C-3PO learned new abilities.

Model 101

a) Technical abilities:
Walking, language (including ability to sound like someone else), vision, object recognition (ability to tell whether clothes will fit or not)

b) Interacted with people to find out information
As 'good guy' had many social inadequacies, but could adapt behaviour based on instructions.

c) Learned new phrases and social interactions e.g. high five