

# **Human-Robot Dynamic Social Interaction**

## **NTT9904-01**

**Progress Report: July 31, 2000—December 31, 2000**

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### **Project Overview**

NTT researchers are interested in the question of whether a physical robot produces a more direct emotional coupling with human beings than does a computer generated graphical image of a similar robot. At MIT we are building a robot that has human-like facial expressions and shoulder and neck gestures, and that perceives human motion and facial expressions. This is coupled to an emotional system so that the person and the robot naturally follow normal human communication social dynamics. This robot will be installed at the NTT Communications Science Laboratories in Kyoto where the response of human subjects will be measured and compared to their response a graphical face interface.

### **Progress Through December 2000**

We delivered the first instance of the Kismet 2 robot to NTT in September.

It included the following:

- 7 degree-of-freedom head with 7 motors and drivers
- 2 cameras
- a gyroscope
- custom analog amplifier board
- rack mounted PCs (TL/SBC-6640) set to run QNX
- 3 network cards and a network hub
- 2 frame grabbers
- associated cabling

We then designed the new version of Kismet. The internal part is very similar to the shipped Kismet 2, and all software should work as before. The new version has improved mechanical

robustness. We also designed the facial system for Kismet. It moves skeletons around so that custom touch sensitive skin can be added by NTT.

### **Research Plan for the Next Six Months**

During the period from January 2001 to June 2001 we will fabricate the final version of Kismet, and the new facial system. We will develop a software library for the facial system, and fabricate and digital control system for it.

We will ship to NTT the new Kismet head and face, the new face control system, and the new software. The existing software and head control system already delivered to NTT will work with the new head.