

Mask-bot as a communication interface

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Motivation

- Develop a flexible Robotic Head Research Platform for human robot communication
- Easily change face appearance
- Mountable on humanoid robots

Background

Projecting face image onto a 3D surface is a classic idea
However, if you project video / normal talking head animation, 3D shape will cause distortion - only along its projection axis will give a realistic, less-distorted image

Solutions

Hardware

- Transparent 3D Mask sprayed with rear-projection paint
- Portable LED projector (Acer K11, 200 ANSI lumens)
- Fisheye lens (with macro adapter)
- Pan-tilt unit
- Microphone and speakers, control PCs

Software

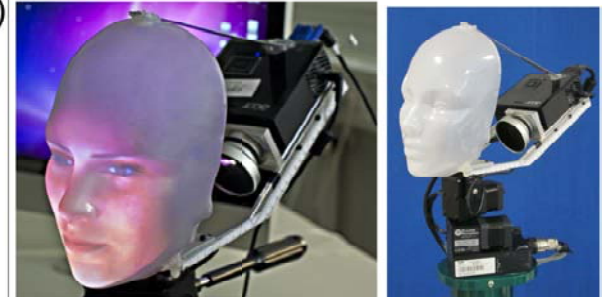
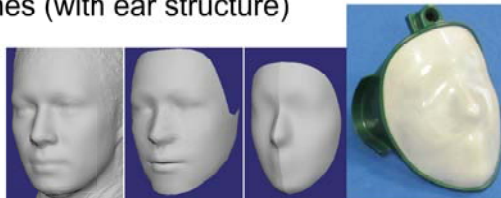
- OpenHRI-based speech communication system (AIST)
- New face model input from camera (Waseda)
- TTS output to talking head animation
- Talking head animation system

Results

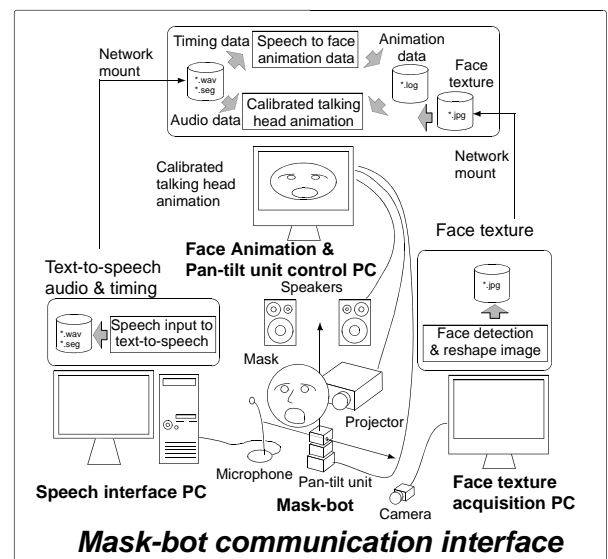
- Realistic 3D appearance from any direction
- Visible 3D face under indoor illumination
- No / less strange distortion caused by 3D mask shape
- Face model can be replaced easily

Future work

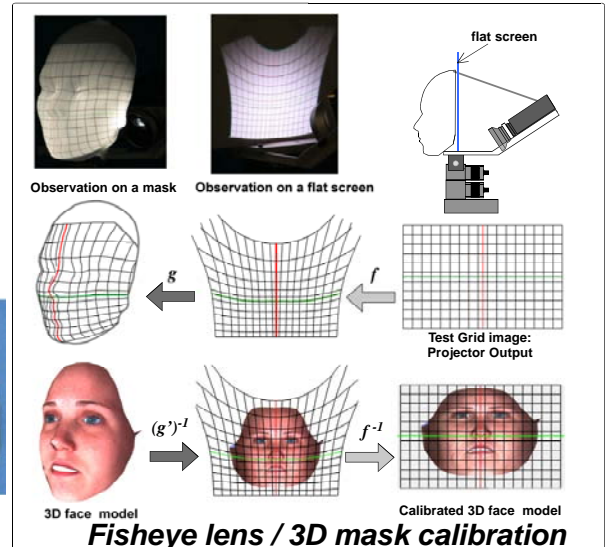
- Smaller system - fit everything inside of head enclosure
- Embedded microphones (with ear structure)
- Embedded camera(s)
- Different 3D masks: averaged faces (gender, ethnicity, age group, etc...)



Mask-bot ver.1 overview



Mask-bot communication interface



Fisheye lens / 3D mask calibration

