DIALOG OF EMOTIONAL KOREAN ROBOTIC FACES:

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Intelligent Learning Robot

- Current robot toys for children are not very intelligent

- They cannot be programmed by child, for instance by voice commands

• Current toys for adults are programmed but are not learning, programming is too complex

We want to design a toy that will truly learn from examples and the user will be able to reprogram the behavior by voice only – the idea of programming by dialog. Two such robots will be learning one from another by dialogs based on speech recognition and speech synthesis.

Intelligent Learning Talking Face

- In contrast to current toys that are either robot arms, animals with non-animated faces or mobile robots, our robot is a set of (perhaps two) talking faces.

- There are no commercial products like this worldwide
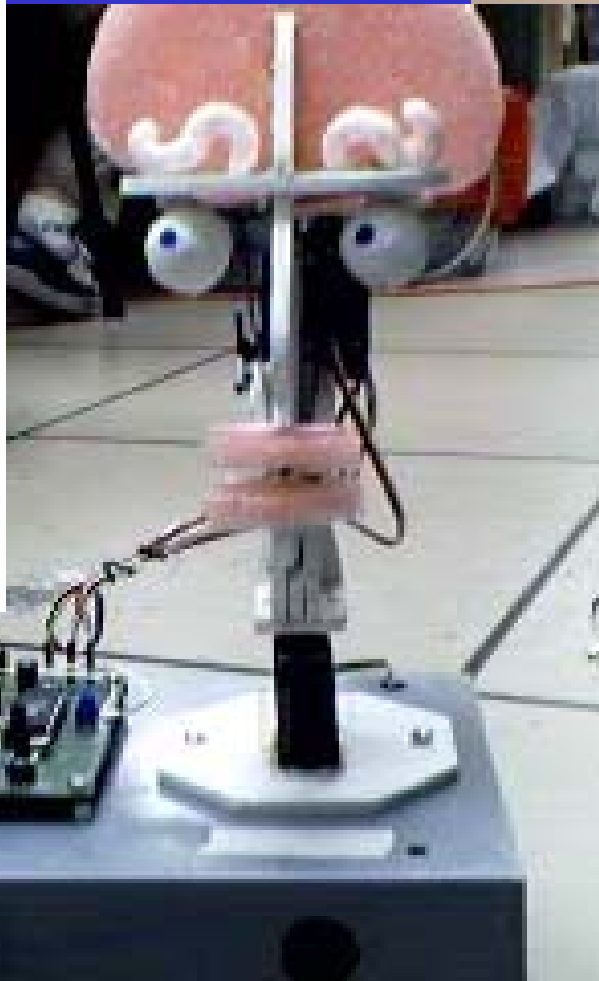
The goal is to <u>create</u> such a robot

The robot should speak English and Korean, and be related to Korean culture and traditions by the way how it will look, speak, behave and sing.

IBM ?

PSU ?

Hollywood?
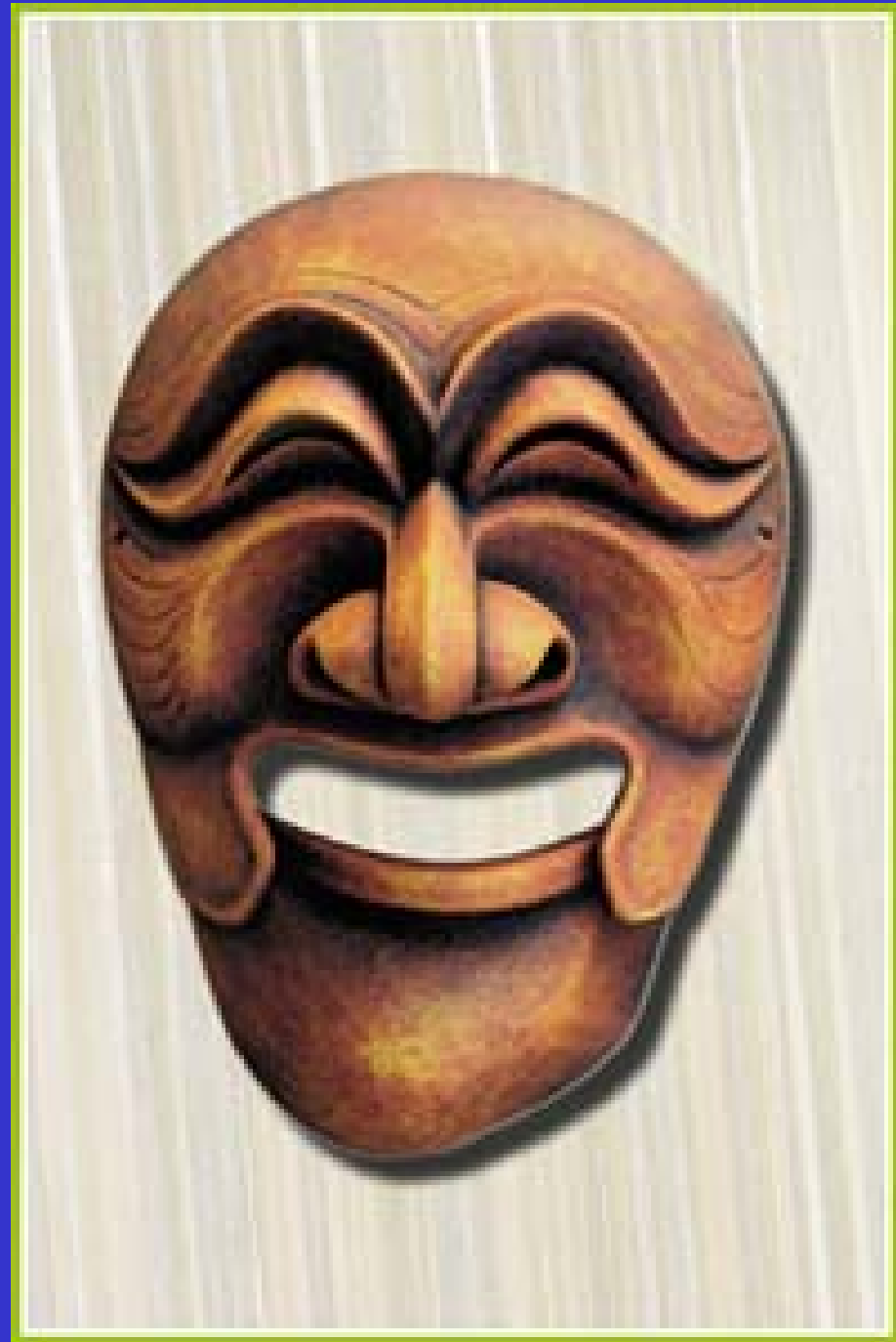
NO!

- Our robot will be truly different
- It will be as Korean as a robot can be.
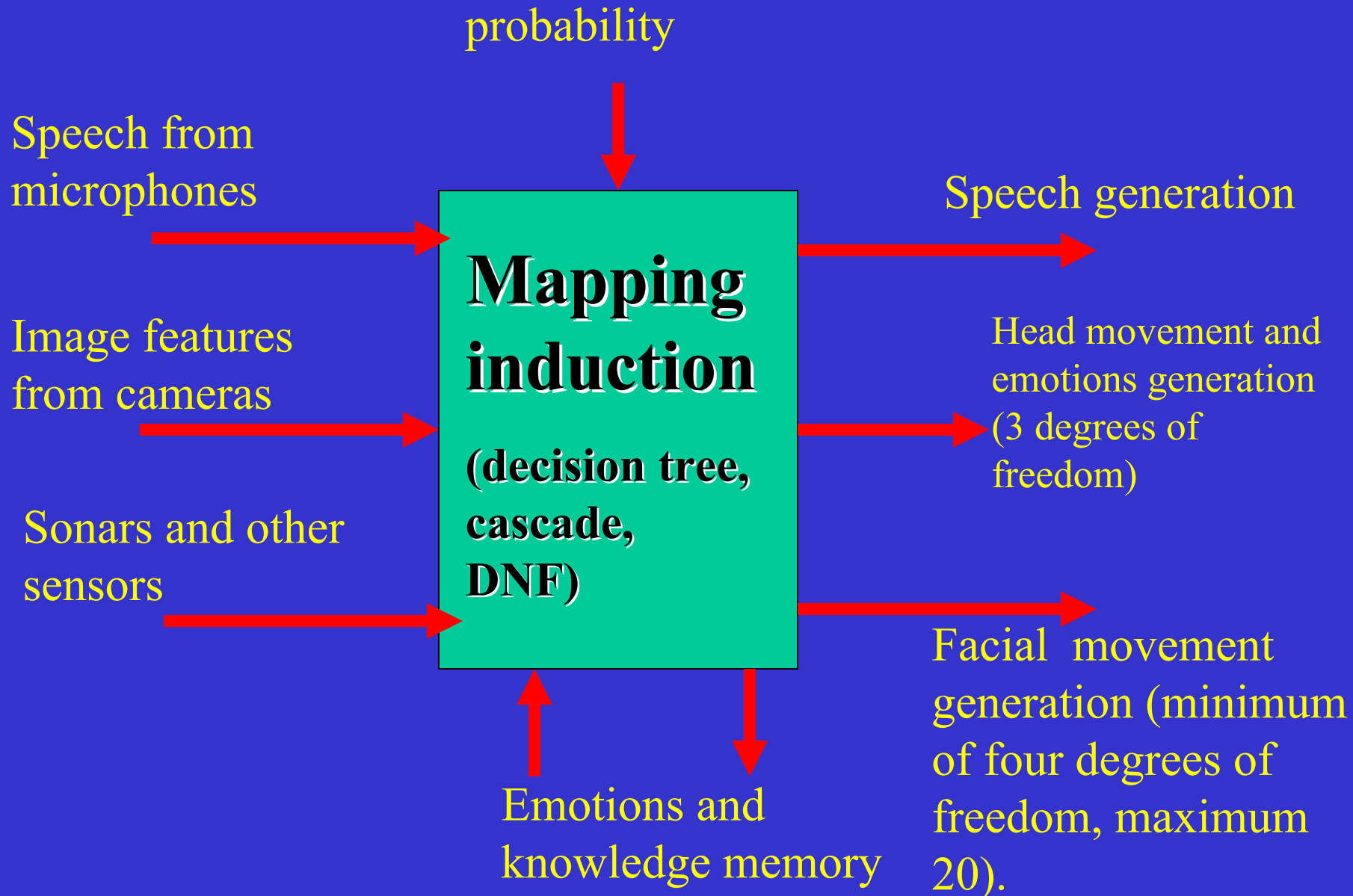
Speech and Dialog Programming

- 1. Elize-like dialogs (Memoni, Dog.Com, Heart, Alice, Doctor)

- 2. Systems with logical data base and natural language parsing (CHAT)

- 3. Conversation Systems that use Neural Nets.

- 4. Model of the robot, model of the user, scenario of the situation, history of the dialog

- 5. Use of word spotting

- 6. Avoding "I do not know", "I do not understand" answers from the robot.

- 7. Use of generalization and analogy in dialog.

Programming Dialogs

- 1. Decision Trees and 20 questions

- 2. Hidden Markov Models and poetry generators

- 3. Morphological boxes with constraints and language games like "who, when, where,what".

- 4. Geography and sight-seeing conversations

- 5. Robot movement and emotions programming

- 6. Visualization of Semantic Networks for children

- 7. Use of modern theories of learning languages

  - Flash Card theory of learning

  - Spectrograms visualization of spoken words for language learners (both Korean and American English).

Mapping environment to behaviors

probability

Speech from microphones

Image features from cameras

Sonars and other sensors

Mapping induction

(decision tree, cascade, DNF)

Speech generation

Head movement and emotions generation (3 degrees of freedom)

Facial movement generation (minimum of four degrees of freedom, maximum 20).

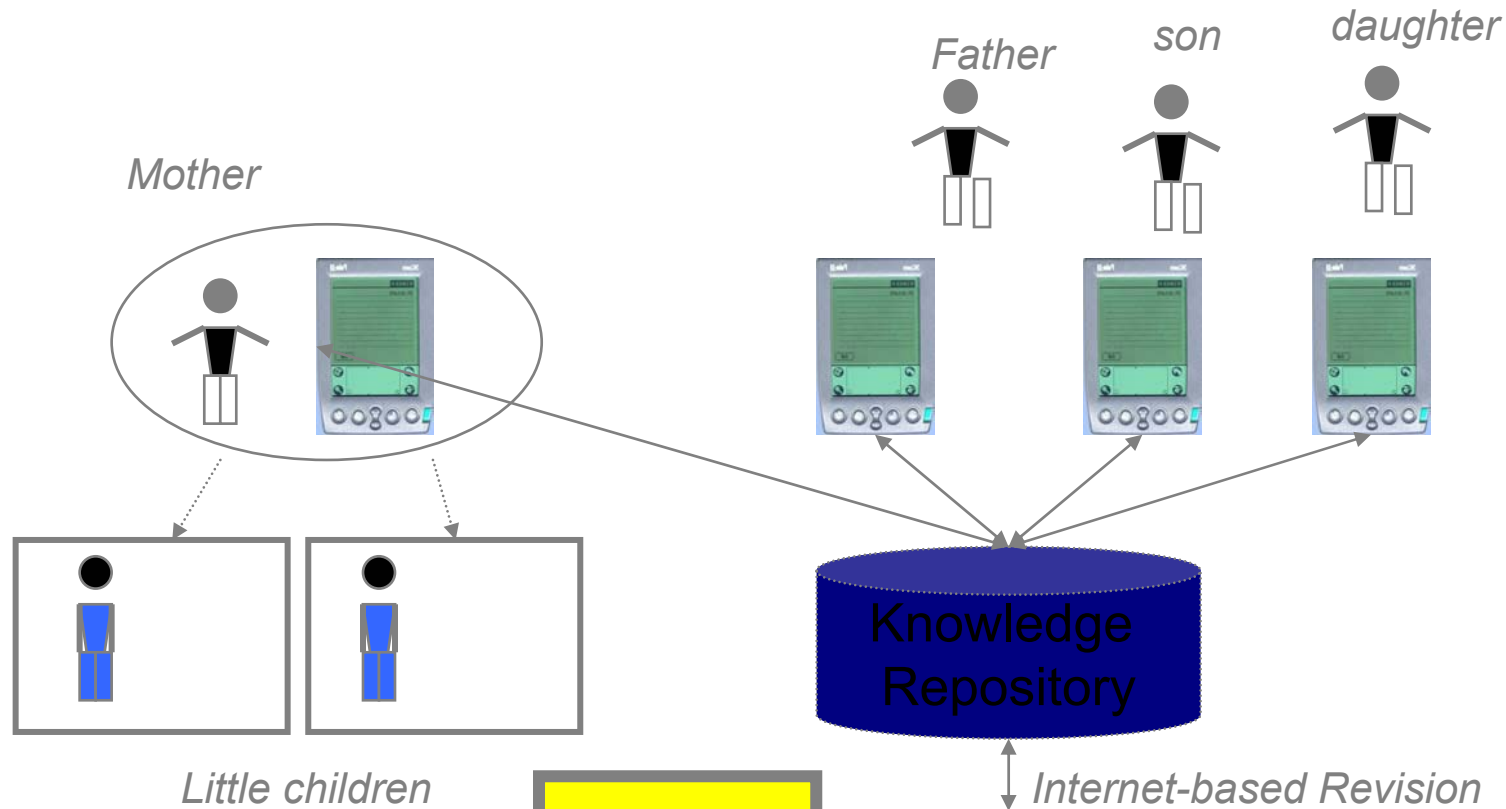Emotions and knowledge memory

Other Similar Speech Products

- 1. Intelligent control of all home appliances

- 2. Tourist Information systems

- 3. Receptionists for hotels, restaurants, etc.

- 4. Talking encyclopaedias and poetry books

- 5. Word-based intelligence games

- 6. Aids for speech-impaired, mentally-impaired or emotionally disturbed persons

- 7. Games for several people, similar to Flirting Cards from Europe

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Universal Home Communicator - voice controlled home applicances