COMPUTATIONAL INTELLIGENCE II
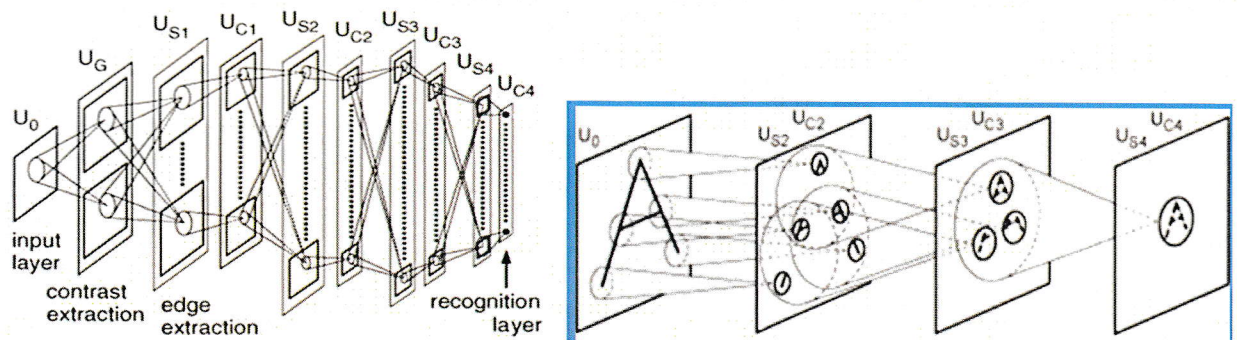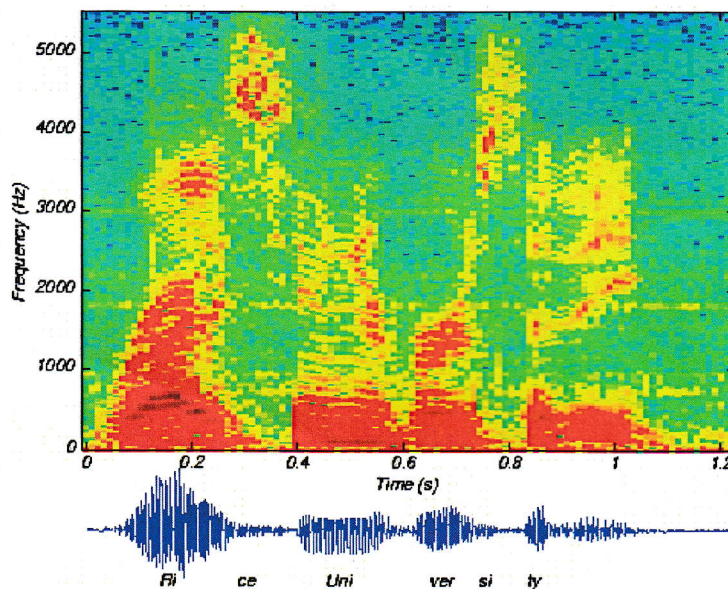## Examination 20.11.2015
Pekka Toivanen

1. Explain what the following terms mean:
   a) Genetic Algorithms
   b) Swarm Intelligence

2. Explain the main idea and function of Neocognitron! How can positional invariance be achieved using it?

3. Let us consider speech recognition. In the figure below there is a speech spectrogram. What kind methods could be used for the classification of phonemes from the cepstral (frequency) data in order to obtain a string of phonemes?

4. Given that a person's last cola purchase was Coke, there is a 90% chance that her next cola purchase will also be Coke. If a person's last cola purchase was Pepsi, there is an 80% chance that her next cola purchase will also be Pepsi.

   a) Draw a Markov Model diagram with states and transitions corresponding to this Coke and Pepsi example.

   b) Calculate the following using the Markov Model: Given that a person is currently a Pepsi purchaser, what is the probability that she will purchase Coke two purchases from now?

5. a) What is Affective Computing?

   b) What are the skills a system with Emotional Intelligence should have?

   c) What kind of applications are there for Affective Computing?