Final Term

4190.408 Artificial Intelligence

Dept. of Computer Science and Engineering, Seoul National University

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Answer to the questions below. Each answer should not be longer than a page.

Use graphs, figures or mathematical formulas for explanation if possible.

1. (20 points) Describe the architecture of Deep Belief Network(DBN). What is the difference between DBN and Multilayer Perceptron(MLP)? Briefly describe the way DBN learns. What is the difference between learning method of DBN and backpropagation algorithm, which is used for MLP? Deep learning technologies like DBN recently broke the previous records in fields of voice recognition, video searching and face recognition performance. What do you think is the reason behind the high performance of deep learning?

2. (20 points) List more than five features of intelligent agent, and describe them briefly. What is the difference between agent and object of object-oriented programming, from the perspective of software engineering? What is the difference between agent and expert system, from the perspective of artificial intelligence?

3. (20 points) What are the features of unmanned vehicles(Google Car, for example) as intelligent agents? Which parts of unmanned vehicles could still be improved?
    What are the characteristics of Apple Siri(or Microsoft Cortana) as an intelligent agent? What kind of characteristics do they satisfy as software agents? Which parts of Siri could still be improved?

4. (20 points) Think about Kitchen Robots, which help kitchen work instead of human(TUM's James & Rosie, for example). What are the artificial intelligence technologies which these robots have already realized, or going to realize? Explain from perspectives of perception, action, memory, learning, inference, prediction, or planning.

5. (20 points) Think about providing service of Google Now, while wearing wearable smart glasses like Google Glass. Suggest an idea which utilizes the technology of artificial intelligence and brain/cognitive science as much as possible. Think about it from perspectives of perception, action, memory, learning, inference, prediction, planning or recommendation.

(100 points in total)