Master of Architecture 1ˢᵗ Semester Examination 2017

Cybernetics of Visual Perception　　　　**Time: 3 Hours**　　　　**Full Marks: 100**

Attempt for 100 marks.

1. Briefly explain the functions and dynamics of the following eye movements:
   a. Saccade
   b. Attention
   c. Microsaccade
   d. Smooth pursuit

$5 \times 4 = 20$

2. If a stimulus filter is defined as a system for extracting meaningful features from raw visual data, describe any four of the following filters and for each depict three scenarios where they are heightened, normal and subdued:
   a. Peripheral vision
   b. Light/ dark adaptation
   c. Viewing comfort angle of the eye/ head complex
   d. Perspective and spatial cognition
   e. Object detection and recognition
   f. Visual weight of object
   g. Semantic network between objects and relative ranking

$(4+ (2 \times 3)) \times 4 = 40$

3. Define a black box from the perspective of an experiment. Briefly explain with an example how human visual perception can be simulated in a black box eg. an artificial neural network by correlating stimulus (high resolution bitmap) to behavior (like reflex, voluntary communication, motor output etc.).

10

4. A lot of our sensory engagement to geography happens through walking – a subject that has been variously explored in informal psychogeography, urban design, cognitive science and robotics. In very general terms discuss any two of the following:
   a. Relation of memory (upto real time) of image sequence to affective states (like surprise, attention, disorientation, flashback etc.)
   b. A reward system of affective states that dictates the lagrangian of walk and the non deterministic feedback cycle
   c. Patterns in the relation between saccade and foot-fall densities after evaluation of the hamiltonian of walk as a performance metric for space planning

$10 \times 2 = 20$

5. Explain why it is easier to make a cartoon of a face than of a building.

10

6. Describe symbols as you might find them in the following contexts:
   a. as being different from signs.
   b. in the anthropomorphisation of a building *ie.* the subconscious ascribing of complex human characters of an individual or a small group of individuals usually in the roles of owner, beneficiary, creator *etc.* to the architecture of the building.
   c. in period styles and their relation to value systems of a society.

$10 + 15 + 15 = 40$