B.E. Comp (Rev) Sem-7. 5/12/13

16-11-2013-DTP-P-8-KG-21

Con. 8692 -13. Robotics & AI. **LJ-14050**

(Revised Course)

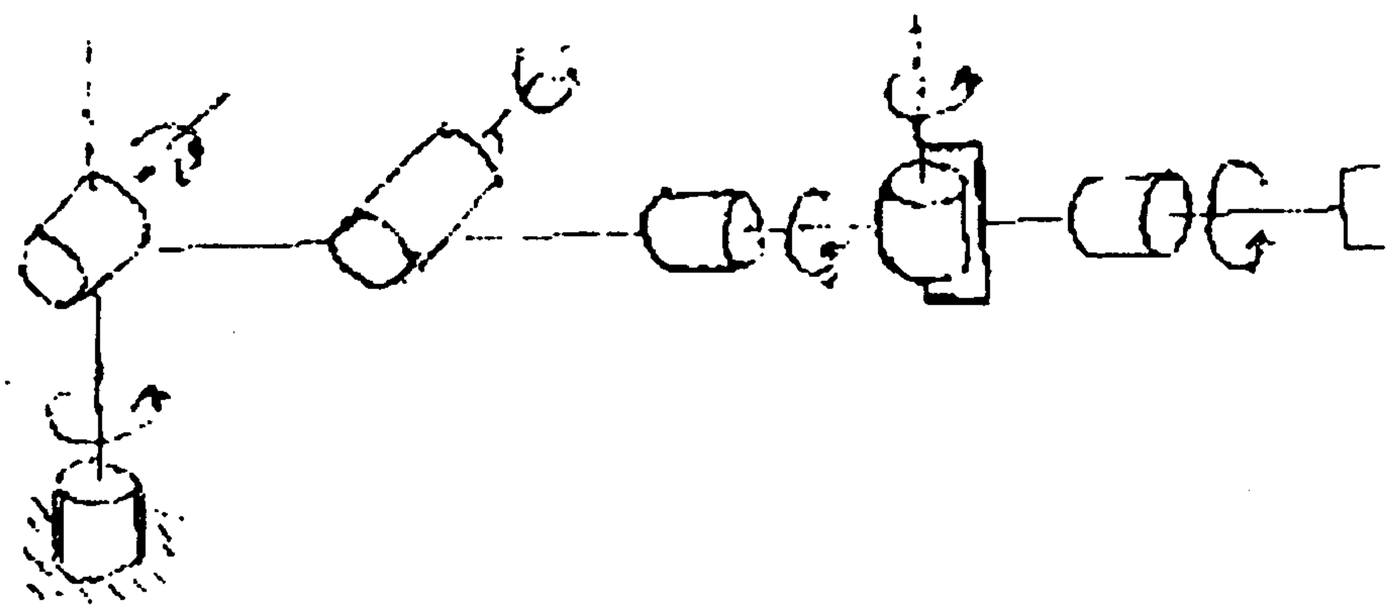
(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** questions from remaining **six** questions.
(3) Assume suitable **data** if necessary.

1. (a) What do you mean robot configuration ? What is work space ? **5**
   (b) Explain, in brief, reactive system. **5**
   (c) Describe unsupervised learning with suitable example. **5**
   (d) Explain screw motion. Hence describe how screw motion involves linear and rotation transformation. **5**

2. (a) Describe different types of environments applicable to A1 agents. **10**
   (b) Define blind search and informed search. Hence discuss the merits and demerits of each. **10**

3. Using DH algorithm, derive homogeneous transformation matrix for following robot. **20**



4. (a) What is decision tree ? How decision tree can be used for inference ? Give suitable example. **10**
   (b) What is planning ? How it defers from searching ? **10**

5. (a) Explain the structure of learning agent. What is role of critic in learning. **10**
   (b) Discuss various learning methods. **10**

[TURN OVER

6. (a) Describe A* algorithm with merits and demerits. **10**

   (b) What is heuristic function ? How will you find suitable heuristic function ? Give suitable example. **10**

7. Write short notes on :- **20**

   (a) Forward and inverse kinematics.

   (b) Sensors used in robotic systems.

   (c) Belief network.

   (d) Hill climbing algorithm.

SEMESTER VII MOBILE COMPUTING 11/12/13

NOV-DEC 2013

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Con. 90103-13. **LJ-14120**

(REVISED COURSE)

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question **No. 1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Assume **suitable** data wherever **necessary.**

1. (a) What is Hidden and exposed terminal problem? Discuss solutions to these problems. **5**

(b) Write short note on wireless local loop. **5**

(c) Compare IEEE 802.11 and Hiyer LAN2. **5**

(d) Which components are new in GPRS as compared to GSM? What is their purpose? **10**

2. (a) Draw and explain iGSM architecture and iGSM procedures. **10**

(b) Explain motivation of WACM also explain WATM generic reference model. **10**

3. (a) Why is routing in multi–hop adhoc networks complicated? What are the special challenges? **10**

(b) Explain Bluetooth protocol stack with neat diagram. **10**

4. (a) Explain how the power management is done in IEEE 802.11 infrastructure based and adhoc networks. **10**

(b) Explain snooping TCP and Mobile TCP with their merits and demerits. **10**

5. (a) Explain protocol architecture of DECT. **10**

(b) Explain three Tier Architecture for mobile computing. **10**

6. (a) Explain the following with respect to mobile IP.
(i) IP Packet delivery.
(ii) Registration.
(iii) Encapsulation. **10**

(b) Describe the mobile satellite system (LEO and GEO). **10**

TURN OVER

7. Write short note on any **four** :– **20**

(a) WML Script.
(b) EPOC.
(c) Threats and Security issues in mobile computing.
(d) PCS Architecture.
(e) CDMA 2000.
(f) ZigBee.

B.E (comp) sem VII 17/12/13
Syst security

25-11-13-DTP16-AK-9

Con.9691-13. **LJ-14237**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from the remaining **six** questions.
(3) Figures to the right indicate full marks.
(4) Answer to the questions should be grouped and written together.
(5) Assume any suitable data wherever required but justify the same.

1. (a) Explain substitution cipher and transposition cipher. **5**
   (b) Does a Public Key Infrastructure use symmetric or asymmetric encryption ? Explain your answer. **5**
   (c) What are the system security goals ? Explain why the balance among different goals is needed. **5**
   (d) What are different types of malicious code ? **5**

2. (a) Explain Advanced Encryption Standard Algoritm in detail. **10**

OR

Use the Playfair cipher to encipher the message, "attack cancelled on Monday. Wait for next message". The secret key can be made by filling the first and part of the second row of a matrix with the word "MORNING". Fillng of rest of the matrix can be done with remaining alphabets. Consider alphabets 'Y' and 'Z' together in one cell of the matrix.

   (b) Write a note on Kerberos system that supports authentication in distributed system. **10**

3. (a) Explain control of access to general objects in operating system. **10**
   (b) Explain nonmalicious program errors with examples. **10**

4. (a) If generator g = 2 and n or P = 11, Using Diffie – Hellamn algorithm solve the following :-
      (i) Show that 2 is a primitive root of 11. **4**
      (ii) If A has a public key '9' what is A's private key ? **2**
      (iii) If B has a public key '3' what is B's private key ? **2**
      (iv) Calculate the shared secret key. **2**
   (b) Explain different denial of service attacks. **10**

5. (a) List, explain and compare different kinds of firewalls used for network security. **10**
   (b) Explain multiple levels security model. Also explain multilateral security. **10**

6. Write a detail note on (any **two**) :- **20**
   (a) E-mail security.
   (b) RSA algorithm (Public key algorithm)
   (c) SSL Protocol.
   (d) Covert channel.

7. (a) Explain the process of Digital Certificate generation and the process of evaluation of authenticity of Digital Certificate. **10**
   (b) Explain packet sniffing and packet spoofing. Explain the session hijacking attack. **10**

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B.E. Comp. sem VII (Rev) Nov-13

Sub: Soft Computings

11-11-13-DTP-P-14-AK-9

Con. 7749-13. **LJ-13927**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) **Figures** to the **right** indicate **full** marks.

1. (a) Model the following as a fuzzy set using suitable membership function - "Numbers close to 6".
(b) Explain standard fuzzy membership functions.
(c) Determine all α - level sets and strong α-level sets for the following fuzzy set.
A = { (1, 0.2) (2, 0.5), (3, 0.8), (4, 1), (5, 0.7), (6.03) }.

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, (6, 0.3)}

2. Design a Fuzzy Controller to determine the the wash time of a domestic washing machine. Assume that the inputs are dirt and grease on the clothes. Use three descriptors for each input variable and five descriptors for output variable. Derive a set of rules for control action and defuzzification. The design should be supported by figures wherever possible. Clearly indicate that if the clothes are soiled to a larger degree the wash time required will be more.

3. (a) Determine the weights after four steps of training for Perceptron learning rule of a single neuron network starting with inital weights :-
$W = [\ 0\ 0\ ]^t$, inputs as $X_1 = [\ 2\ 2]^t$,
$X_2 = [\ 1\ -2]^t$, $X3 = [\ -2\ 2]^t$, $X_4 = [-1\ 1]^t$,
$d_1 = 0$, $d_2 = 1$, $d_3 = 0$, $d_4 = 1$ and $c = 1$.
(b) Explain Mamdani type of Fuzzy Inference system in detail.

4. (a) Prove the following identities :-
(i) For unipolar continuous activation function
$f^1(net) = 0\ (1 - 0)$
(ii) For bipolar continuous activation function :-

$$f^1(net) = \frac{1}{2}(1 - 0^2)$$

(b) Explain error back propagation training algorithm with the help of a flowchart.

5. (a) Explain RBF network and give the comparison between RBF and MLP.
(b) Explain with examples linearly and non-linearly separable pattern classification.

6. (a) What is learning in neural networks ? Differentiate between Supervised and Unsupervised Learning.
(b) Explain Travelling salesperson problem using simulated annealing.

7. Write notes on any **two** of the following :-
(a) Learning Vector Quantization.
(b) Derivative Free Optimization.
(c) Winner take all learning rule.

B.E. Comp. Sem VII NUV-13 28/11/13
Sub:- E-Comm.

Con. 7743-13. **(REVISED COURSE)** **LJ-13921**

(3 Hours) **[Total Marks : 100**

N. B. : (1) Question No. **1** is **compulsory**.
(2) Solve any **four** from **remaining**.

1. (a) What is E-commerce? How is it different from E-business? Explain the different elements of E-commerce and E-business. Give proper examples for each. **15**
(b) Explain in brief what do you mean by semantic web. **5**

2. (a) Compare the different session tracking techniques with proper justification. **10**
(b) Explain SET protocol for electronic payments. **10**

3. (a) Explain the REST based architectural style. **10**
(b) What is Enterprise Application Integration? Explain the different EAI topologies. **10**

4. (a) Explain the e-business model suited for IT based business organisations. **10**
(b) What are e-wallets? How they can be used in conjunction with e-cash for making electronic payments? **10**

5. (a) What is a middleware. Explain any one type of middleware which uses synchronous communication. **10**
(b) Explain different types of web-based auctions and auction related services. **10**

6. (a) Explain virtualization and the different techniques used to achieve virtualization. **10**
(b) What are the different security measures that can be applied to protect a private intranet from public internet. **10**

7. Write short notes any **two**:– **20**
(a) Wireless Application Protocol (WAP)
(b) Really simple syndication (RSS)
(b) Mobile Agents
(e) Virtual communities.

Digital Signal & Image Processing
SEM-VII BE COMP 30/11/13

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Con. 8479-13. **LJ-13993**

(REVISED COURSE)

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** out of remaining **six**.
(3) Assume suitable **data** wherever **necessary** and state them clearly.

1. (a) Justify/Contradict the following statements (any **four**) :– **20**
   (i) Unit step sequence is a powersignal.
   (ii) If the energy of the signal is finite its power is zero.
   (iii) Brightness discrimination is poor at low levels of illumination.
   (iv) Enhancement process does not add any information to the image.
   (v) All image compression techniques are invertible.

2. (a) Write an expression for a 2-D DFT. What is its relationship with one dimension DFT? How one-dimensional FFT algorithm can be used to compute two dimensional DFT of an digital image. **10**
   (b) Define signals and systems and also give any 4 classification of Discrete Time Signals with examples. **10**

3. (a) Compare and contrast between the following (any **two**) :– **10**
   (i) Spatial Domain Processing and Transform Domain Processing.
   (ii) Image Enhancement and Image Restoration.
   (iii) Lossless and Lossy Compression.

   (b) Find the DFT of the given image. **5**

$$\begin{bmatrix} 0 & 1 & 2 & 1 \\ 1 & 2 & 3 & 2 \\ 2 & 3 & 4 & 3 \\ 1 & 2 & 3 & 2 \end{bmatrix}$$

   (c) Find the circular convolution of **two** sequences - **5**

$$x_1(n) = \{1,-1,2,-4\} \text{ and } x_2(n) = \{1,2\}$$

[TURN OVER

4. (a) Find the universe Z-transform of - **10**

$$x(z) = \frac{z^3 - 4z^2 + 5z}{(z-1)\ (z-2)\ (z-3)}$$

(i) $ROC = |z| > 3$

(ii) $ROC = |z| < 1$

(iii) $ROC = 2 < |z| < 3$

(b) What are the different types of redundancies in images. **5**

(c) Explain Fidelity Criteria. **5**

5. (a) Explain filtering in spatial Domain. **10**

(b) Explain segmentation based on discontinuities. **5**

(c) Explain Hough - Transform and its applications in detection of shapes. **5**

6. (a) Explain the salient features of the following codes :– **10**

(i) Huffman code

(ii) Lossy predictive coding

(iii) Transform coding.

$$x(z) = \frac{z^3 - 4z^2 + 5z}{(z-1)\ (z-2)\ (z-3)}$$

(b) Explain with suitable example region splitting and merging technique for image segmentation. **10**

7. Write short notes on (any **four**) :– **20**

(i) Sampling and Quantization.

(ii) Edge linking and Boundary detection via graph theoretic technique.

(iii) Image Restoration Model.

(iv) Trimmed Average filter.

(v) Homomorphic filtering.
