

END SEMESTER EXAMINATIONS (DECEMBER 2021/JANUARY 2022) - QUESTION PAPER - PART A

COURSE CODE : ICE-4057
COURSE NAME : Multi-Sensor Data Fusion
SEMESTER : VII
DATE OF EXAM : 24/12/2021
DURATION : 45 + 5 minutes

Instructions for Students:

(1) ANSWER ALL THE QUESTIONS.

(2) EACH QUESTION CARRIES 1 MARK.

(3) YOU ARE INSTRUCTED TO INFORM THE INVIGILATOR AFTER SUBMISSION OF THIS FORM IN THE CHAT SECTION.

* Required

* This form will record your name, please fill your name.

1

STUDENT NAME: *

2

REGISTRATION NUMBER: *

3

The fusion classification proposed by Durrant-Whyte is based on _____. (1 Point)

- None
- Fusion type
- I/O characteristics
- Sensor configuration

4

Data incest is not a drawback in _____ topology. (1 Point)

- Decentralized
- Centralized
- Hierarchical
- Both Decentralized and Hierarchical

5

In image applications, fusing images of same scene taken from different viewing angles is an example for _____ sensor configuration. (1 Point)

- Cooperative
- None
- Competitive
- Complementary

6

_____ algorithm is used in video de-noising application. (1 Point)

- One sided DTW
- DDTW
- CDTW
- DTW

7

Find the optimal warping path for the given D matrix. (1 Point)

0.04	2.25	0.81	1
5.29	0.04	6.25	1.21
0.64	0.09	2.56	2.89
0.36	3.24	0.49	1.96

- $W_{DTW} = ((1, 1), (2, 2), (3, 1), (3, 2), (4, 3), (4, 4))^T$
- $W_{DTW} = ((1, 1), (2, 2), (3, 2), (3, 4), (4, 4))^T$
- $W_{DTW} = ((1, 1), (2, 2), (3, 3), (4, 4))^T$
- $W_{DTW} = ((1, 1), (2, 2), (3, 2), (4, 3), (4, 4))^T$

8

Temporal alignment is used as the primary fusion algorithm in _____ class of applications. (1 Point)

- Dal-FeO & Dal-DaO
- Dal-DaO & Del-FeO
- Dal-DaO & Fel-FeO
- Dal-FeO & Fel-DeO

9

_____ is not a constraint for DTW. (1 Point)

- Windowing
- Boundary conditions
- Monotonicity
- Continuity

10

State true or false:

- a) Temporal alignment is the conversion of multiple data or measurements which refer to the same object or phenomena.
- b) Continuity is one of the constraints in video compression.

(1 Point)

- a) is false and b) is false
- a) is true and b) is false
- a) is true and b) is true
- a) is false and b) is true

11

_____ algorithm is widely used for finding the optimal assignment matrix. (1 Point)

- Hungarian
- SIFT
- Dynamic programming
- k means

12

Spatial alignment is more commonly referred to as _____. (1 Point)

- Radiometric normalization
- Temporal alignment
- Image classification
- Image registration

13

_____ is a method of radiometric normalization process for converting sensor measurements into 0 or 1. (1 Point)

- Fuzzy
- Binarization
- None
- Min-max

14

ANOVA test cannot be performed on _____ scale of measurement. (1 Point)

- Nominal
- Interval
- Ordinal
- Ratio

15

_____ method is a Bayesian method used for single target data association.
(1 Point)

- None
- GNN
- NNSF
- PDAF

16

Which of the following is characteristic of MHT. (1 Point)

- Non-Bayesian
- Simple to implement
- Used for single target tracking.
- Complex and expensive

State true or false.

- a) The gating method helps in pruning matches that are geometrically likely from the start.
- b) Data association is the process of associating uncertain measurements to known tracks.

(1 Point)

- a) is true and b) is true
- a) is true and b) is false
- a) is false and b) is false
- a) is false and b) is true

_____ is a model driven data fusion framework. (1 Point)

- Pau's model
- Luo and Kay's model
- Omnibus model
- Esteban model

Level 2 of JDL model is _____ refinement (1 Point)

- Subobject
- Situation
- Threat
- Object

20

Data mining focuses on the detection of relationship and entities through _____ reasoning. (1 Point)

- a) Abductive
- b) Deductive
- c) Inductive
- Both a) and c)

21

_____ selects the most suitable sensor or source for collection of desired observables. (1 Point)

- Information needs
- Objective setting
- Task and plans
- Observability context

22

The duality of Estimate is _____ in resource management. (1 Point)

- Objective
- Resource
- Plan
- Control

23

Which one of the following is not a resource in IPC. (1 Point)

- Weapons
- Sensors
- People
- Threats

24

_____ data driven framework has fast computation ability. (1 Point)

- Luo & Kay's
- Omnibus
- Waterfall
- Esteban

25

Full form of **TRIP** (1 Point)

- Travel Resource Information Processing
- Travel Requirements Information Processing
- Transformations of Resource Information Processing
- Transformations of Requirements for Information Processing

26

The user requirement(UR) level 0 represents _____. (1 Point)

- Information needs
- Observables
- Collection objectives
- Tasks and plans

27

Relational state estimation is the characteristic of the recommended data fusion level _____. (1 Point)

- Level 0:Signal/feature assessment
- Level 4: Threat assessment
- Level 2: Situation assessment
- Level 1: Entity assessment

28

Dasarathy's _____ I/O model represents Model-based detection feature extraction. (1 Point)

- FEI-DAO
- DEI-FEO
- DAI-DEO
- DEI-DAO

_____ filter is a recursive estimator. (1 Point)

- Information
- None
- Bayesian
- Kalman

The objective of _____ filtering is to remove unrelated data from the huge data stream. (1 Point)

- Information
- Kalman
- None
- Bayesian

In the given Bayes equation, $P(x)$ represents _____. (1 Point)

$$P(\mathbf{x} | \mathbf{z}) = \frac{P(\mathbf{z} | \mathbf{x})P(\mathbf{x})}{P(\mathbf{z})}.$$

- Posterior distribution
- Conditional probability density function
- Prior probability density function
- Likelihood

State true or false:

- a) Track splitting completely decomposes multiple target tracking problems into a single target problem.
- b) Global NNSF used for multi-object tracking is also called a greedy algorithm.

(1 Point)

- a) is false and b) is true
- a) is true and b) is false
- a) is true and b) is true
- a) is false and b) is false

This content is neither created nor endorsed by Microsoft. The data you submit will be sent to the form owner.