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Answered

core: 9 / 10

Outlier detection

What is a popular rule of thumb for outlier detection?

- [x] 3σ rule
- [ ] 3μ rule
- [ ] 2σ rule
- [ ] σ^2 rule

uestions

- Glass' law 1
- Organic Computing systems 6
- Organic Computing alternatives 1
- Organic Computing and MAPE 1
- Intelligent Systems design 2
- **Outlier detection** 1
- Mahalanobis 1
- RLBS 2
- PAA / PAC 2
- Signal processing property 1

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Answered: 10 / 10

1 p

PAA / PAC

Which statements are correct for the PAA/PAC approach?

- [ ] Each section is replaced by the standard deviation of contained samples
- [x] The time series is divided into sections of equal length
- [x] The abbreviation stands for piecewise aggregate approximation / compos
- [ ] The result is a smooth line without breaks and jumps

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PAA / PAC

Signal processing 1

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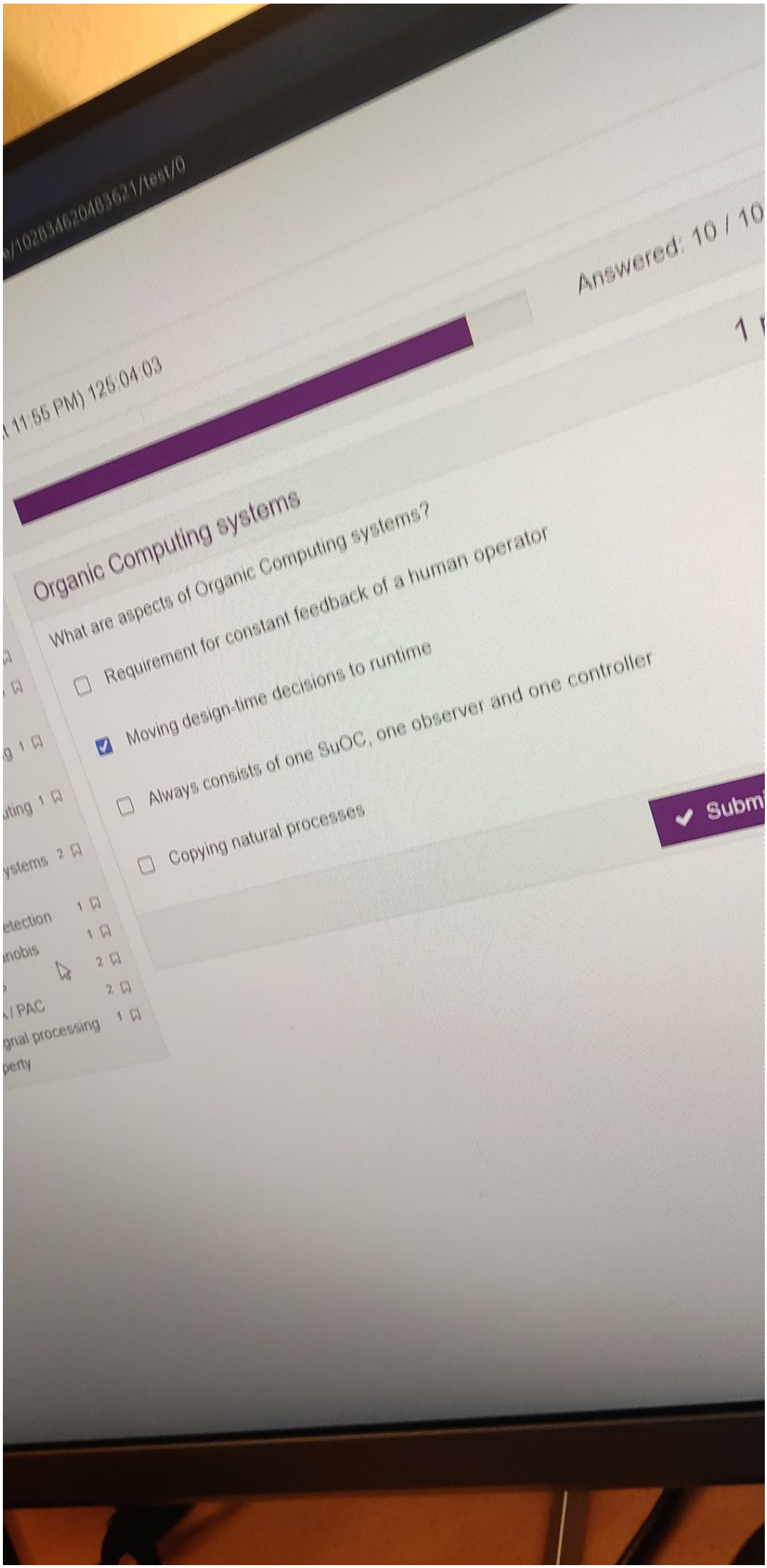
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Answered: 10 / 10
Organic Computing systems
What are aspects of Organic Computing systems?
Requirement for constant feedback of a human operator
Moving design-time decisions to runtime
Always consists of one SuOC, one observer and one controller
Copying natural processes
Subm
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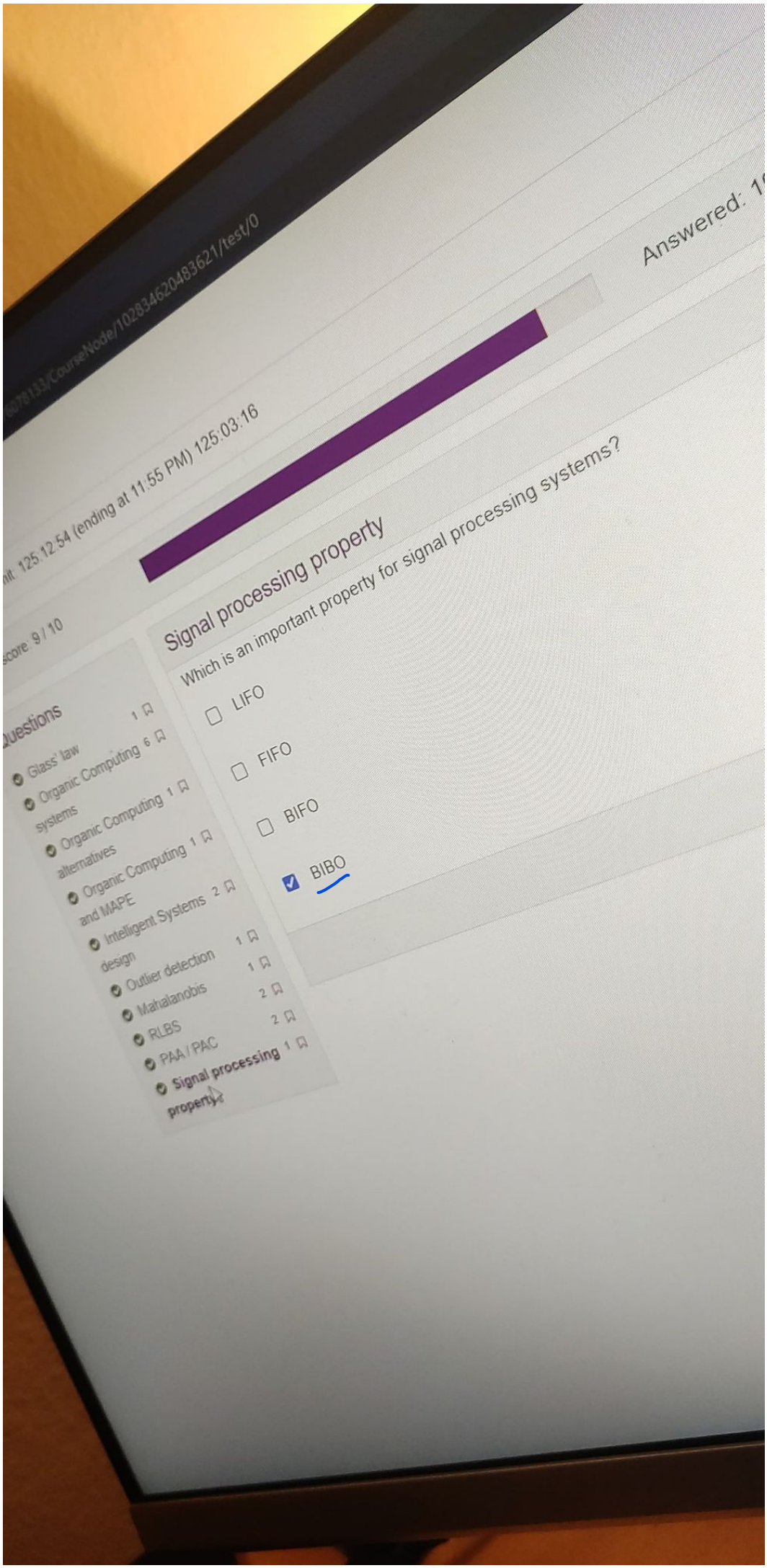
Answered:
Signal processing property
Which is an important property for signal processing systems?
LIFO
FIFO
BIFO
BIBO
Questions
Glass' law 1
Organic Computing systems 6
Organic Computing alternatives 1
Organic Computing and MAPE 1
Intelligent Systems design 2
Outlier detection 1
Mahalanobis 1
RLBS 2
PAA / PAC 2
Signal processing property 1

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Answered: 1

Organic Computing alternatives

Which are initiatives in the same field as Organic Computing?

- [x] Self-adaptive and self-organising systems
- [ ] Computer Vision
- [x] Autonomic Computing
- [x] Proactive Computing

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ic Computing 1

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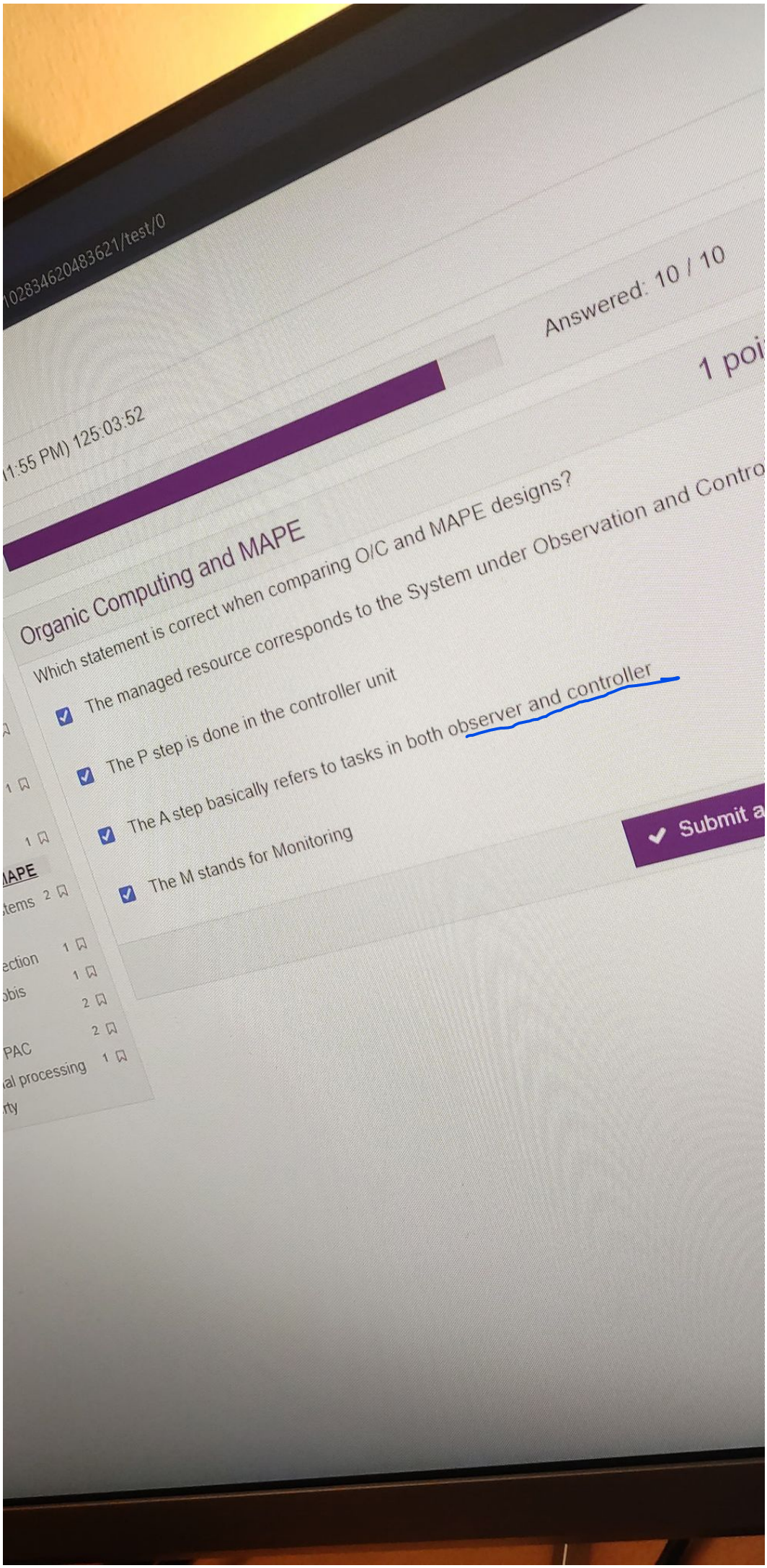
Outlier detection 1

Mahalanobis 1

RLBS 2

PAA / PAC 2

Signal processing property 1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Answered: 10 / 10
1 poi
Organic Computing and MAPE
Which statement is correct when comparing O/C and MAPE designs?
The managed resource corresponds to the System under Observation and Contro
The P step is done in the controller unit
The A step basically refers to tasks in both observer and controller
The M stands for Monitoring
Submit a
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Answered: 10 / 10

1 point

RLBS

Which statements are correct for the Run-length-based signature (RLBS)?

- [x] The representation of time-series using RLBS is much shorter than original number
- [x] Intuitively, RBLS filters all isolated resp. non-repeated samples
- [ ] RLBS makes use of Shannon's entropy formula as basis
- [ ] RLBS is perfectly able to model the time-dependent behaviour traversing th

Submit

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Mahalanobis 1
RLBS 2
PAA / PAC 2
Signal processing 1
property

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Answered: 10 / 10

1 point

Intelligent Systems design

Which statements are correct for design processes of intelligent systems?

- [x] In general, all decisions up to the requirements level should become adaptable
- [x] The design of an intelligent system comprises two system parts rather than just on
- [ ] The most frequent adaptations are observed at test and configuration level
- [ ] There is no defined start for the operation anymore

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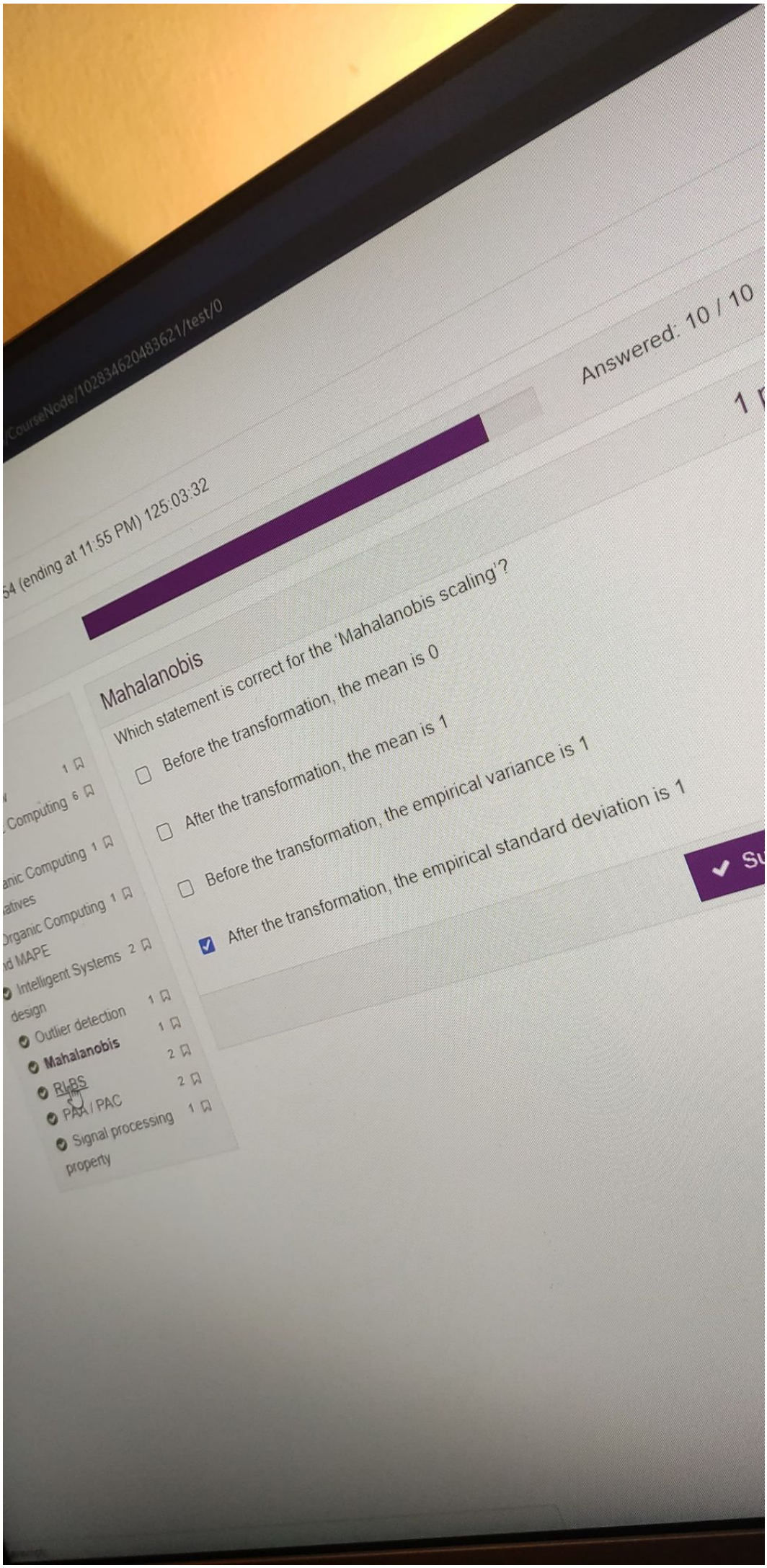
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Answered: 10 / 10
Mahalanobis
Which statement is correct for the 'Mahalanobis scaling'?
Before the transformation, the mean is 0
After the transformation, the mean is 1
Before the transformation, the empirical variance is 1
After the transformation, the empirical standard deviation is 1
Computing 6
Intelligent Systems 2
design
Outlier detection 1
Mahalanobis 2
RLBS 2
PAA / PAC
Signal processing 1
property

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Answered: 10 / 1

1

Glass' law

What does Glass' law state?

- [x] Adding 25% functionality results in a 100% increase in complexity
- [ ] Complexity is doubled with every 50% increase of functionality or connectio
- [ ] With each new connection, the complexity of the system is doubled
- [ ] Complexity in software doubles roughly every two years

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Features

1 point

Answered

Which of the following statements about features are correct?

- [ ] n the sliding window approach, the parameter of the window size is uncritical, i.e. the approach is insensitive to the choice.
- [ ] A disadvantage is that these features are sensitive to outliers and noise.
- [ ] In the growing window approach, the detection of smaller phenomena becomes easier with growing window size.
- [x] An advantage of statistical time-dependent features is that all time-series are mapped to vectors of the same length.

Submit answer | Next question

Similarities

1 point

Answered

Which statement regarding similarities are correct?

- [x] The Mahalanobis norm is defined using the inverse of the covariance matrix of the data values.
- [ ] The Euclidian distance always needs to be standardised with the variance of all feature values.
- [ ] The Hamming distance between “APPLE” and “BERRY” is 4.
- [x] The Cosine distance makes use of the normalised scalar product of two vectors.

Submit answer

Next question

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1 point

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Submit answer | Next question

Similarity Measures

1 point

Answered

Which statements about dynamic similarity measures are correct?

- [x] The first step of the LCSS approach searches for atomic matches.
- [ ] DTW must start with a pair of the first entries of both time series and end with pairs of k stable matchings at the end. For instance, the last k entries must be mapped constantly between both time series.
- [x] The most desirable path in the warping matrix of DTW is in general according to the diagonal of the matrix.
- [ ] LCSS is the abbreviation for Least Common sample segments.

Submit answer | Next question

Segmentation

1 point

Answered

Which statements regarding segmentation are correct?

- [ ] The SWAP technique combines a sliding window with a top down approach.
- [x] Equidistant splitting s an online method that establishes a segmentation into segments of equal length.
- [x] Segmentation aims at a subdivision of longer sequences into shorter time series.
- [ ] The bottom-up approach is an online technique with runtime complexity of $O(n^2)$.

Submit answer | Next question

Segmentation Process

1 point

Answered

What are possible generic objectives for a segmentation process?

- [ ] Highest possible reconstruction error
- [x] Segmentation at conspicuous points (i.e. PIP))
- [x] Segmentation by changes
- [x] Lowest possible approximation error

Submit answer

Next question

Clustering Routines

1 point

Answered

What are interesting aspects of clustering routines?

- [x] How to define the number of desired clusters?
- [x] How to interpret the clustering results?
- [x] What impact does the pre-processing have on the clustering approach and result?
- [x] How to treat outliers?

Submit answer

Next question

Particular Clustering Methods

1 point

Answered

Which statements about particular clustering methods are correct?

- [x] C-Medoids is less affected by outliers (in comparison to c-means).
- [x] Average linkage provides a trade-off between single and complete linkage.
- [x] The advantage of complete linkage over single linkage includes avoidance of chaining affects.
- [x] In c-means, cluster centres are only moved if the value of the target function decreases as a result.

Submit answer

Next question

Classification

1 point

Answered

Which statements about classification are correct?

- [ ] Random forests typically have higher prediction accuracy than pure decision trees.
- [ ] The k-NN approach requires high computational effort for the training phase.
- [x] The 1-R classifier uses just one feature for the classification decision.
- [x] Considering the index as a feature, the gain ratio indicates this feature as optimal but also leads to poor classification test error (->overfitting)

Submit answer | Next question

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1 point

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Submit answer | Next question >

Classification Methods

1 point

Answered

Which statements about classification methods are correct?

- [x] The "Kernel Trick" maps samples into an inner product space.
- [ ] In Bootstrapping, the asymptotic proportion of unique samples in the learning set is about 50%.
- [x] The Gini index is a possible purity measure.
- [ ] The SVM approach requires Shannon's entropy as measure to establish the decision boundary.

Submit answer

Generative Classifiers

1 point

Answered

Which of the following statements about generative classifiers are correct?

- [ ] They use a discrimination function that maps observations to a class.
- [ ] They are always realised as Gaussian Mixture Models.
- [x] They model those processes that caused the observations.
- [ ] They are constructed and interpreted by human experts.

Submit answer

Next question

Gaussian Mixture Models

1 point

Answered

Which of the following statements about GMMs are correct?

- [x] Singularities can occur in GMM training in all cases with the number of Gaussians greater one.
- [x] Gamma defines the responsibilities of components.
- [x] The parameters of the rule premises can be determined by a Maximum-Likelihood approach.
- [x] Expectation Maximisation is an alternating process combining the optimisation of r and μ.

Submit answer Next question

Self-Organisation

1 point

Answered

Which of the following statements about measuring self-organisation are correct?

- [ ] The static degree of self-organisation distinguishes between the four classes of strong self-organised, self-organised, weakly self-organised and disturbed.
- [x] For the comparison of different measures between systems, we have to take into consideration how far the systems made use of their self-organisation capability.
- [x] Measuring self-organisation as a process relies on observing the relationships between components in the system through message exchange.
- [ ] The freedom for self-organisation is always predefined and fully available at design-time.

Survival Cycle

1 point

Answered

Which of the following statements about the “survival cycle” are correct?

- [ ] Flexibility can be expressed as *1 - Robustness*.
- [x] The target space comprises all system states with utility higher than a target value.
- [ ] Flexibility means that the system reacts fast and efficient to disturbances.
- [ ] The acceptance space covers all states under disturbed conditions.

Robustness

1 point

Answered

Which of the following statements are correct?

- [x] The structural sensitivity function σ is defined as the utility change caused by a disturbance or the gradient of the utility function.
- [x] Robustness is always expressed in relation to a specific set of disturbances.
- [ ] A fully robust system has an active robustness of zero.
- [x] The effective utility degradation over time serves as basis for comparing the robustness of different systems.

RL elements

1 point

Answered

Which of the following aspects is part of the four basic elements of reinforcement learning?

- [x] The policy
- [ ] The Modelling technique
- [x] The Reward
- [ ] The Survival Cycle

Q-Learning

1 point

Answered

Which of the following statements about Q-Learning are correct?

- [x] Maintains a list of Q-values for all state-action-pairs.
- [ ] Is an on-policy temporal-difference learning algorithm.
- [x] Uses the max operator for all actions possible from the next situation.
- [x] Probably one of the most famous techniques in reinforcement learning.

Submit answer Next question

XCS

1 point

Answered

Which of the following statements about the extended classifier system are correct?

- [ ] *Often,* α is set to 1 and ν is usually set to 100. These parameters control how strong the accuracy increases when the error is higher than ε_0.
- [x] Upon receiving the reward in a single-step problem, the prediction value of each classifier contained in the previous action set is updated. This done by adding beta multiplied with the difference between reward and prediction to the old prediction value.
- [ ] The prediction array calculates the prediction-weighted sum of all fitness values advocating the same action.
- [x] A classifier contains the primary attributes condition, action, prediction, error, and fitness as well as further attributes.

Mutual Influences

1 point

Answered

Which of the following statements about Mutual Influences (MI) are correct?

- [ ] MI only occur in setting, where two robots act in an isolated manner.
- [ ] The estimation step focuses only on internal aspects of the agent, which are extended to the influence of others in the reflection step.
- [x] MI refers to effects of configurations of entities on the utility of others.
- [ ] The MI process comprises the six steps observation, distribution, estimation, reflection, evaluation, and adaptation.

Submit answer

Next question

Answered: 10 / 10

Correlation Measures

1 point

Answered

Which of the following statements about correlation measures are correct?

- [ ] The Kendall Rank method assumes values between *0* and *+100*.
- [ ] The Pearson correlation is able to detect non-linear correlations.
- [x] The Maximal Information method is an extension of the Mutual Information technique considering real values.
- [x] A value of 0 for the Spearman Rank method means that no dependency has been detected.