

平成22年度 冬学期試験 答案用紙

科目番号: 1 0 0 2 7

科目名: 論文構成法

担当教員名: M. J. マクドナルド

試験日: 平成23年2月1日 (火)

名前

(ローマ字で記入)

学生証番号

所属

(ローマ字で記入)

QUESTION AND ANSWER SHEET

1. Parts of a paper

(10 points)

Circle the best answer to each question.

1. A good title should be:
 - a. Long
 - b. Theoretical
 - c. Descriptive
 - d. Entertaining
2. Which of the following is not usually included in an abstract?
 - a. Background
 - b. References
 - c. Results
 - d. Conclusions
3. What is the usual content of an introduction?
 - a. Background, motivation, your work
 - b. Aim, your work, results
 - c. Background, your work, evaluation
 - d. Your work, results, evaluation
4. What is the main purpose of the conclusions/discussion section?
 - a. To summarize the report
 - b. To present your findings in more detail
 - c. To consider the significance of your findings
 - d. To show how you reached your results
5. What is the general shape of a technical paper?
 - a. General → particular
 - b. Particular → general
 - c. Particular → general → particular
 - d. General → particular → general
6. Which pattern is most typical of technical papers?
 - a. Background – methods – findings - discussion
 - b. Methods – discussion – background – findings
 - c. Findings – background – methods – discussion
 - d. Discussion – methods – findings – background
7. In which part of a paper would you usually find ideas for future work?
 - a. Abstract
 - b. Introduction
 - c. Main body
 - d. Conclusions

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8. In which part of a paper would you usually find most figures?
 - a. Abstract
 - b. Introduction
 - c. Findings
 - d. Conclusions
9. In which part of a report would you usually find most references?
 - a. Abstract
 - b. Introduction
 - c. Main body
 - d. Conclusions
10. In which part of a paper would you usually find most numerical data?
 - a. Abstract
 - b. Introduction
 - c. Main body
 - d. Conclusions

2. Ordering sentences in an abstract

(10 points)

Number these clauses in the correct order.

- ___ Experiments show that APCA outperforms PCA and other methods in terms of accuracy, robustness and generalization ability.
- ___ which first applies PCA to construct a subspace for image representation;
- ___ This problem becomes more serious in applications when only one sample images per class is available.
- ___ In this paper, we present a linear pattern classification algorithm, Adaptive Principal Component Analysis (APCA),
- ___ Most face recognition approaches either assume constant lighting condition or standard facial expressions,
- ___ This enhancement method is evaluated on the Asian Face Image Database.
- ___ then warps the subspace according to the within-class covariance and between-class covariance of samples to improve class separability.
- ___ and thus cannot deal with both kinds of variations simultaneously.
- ___ This technique performed well under variations in lighting conditions.
- ___ To produce insensitivity to expressions, we rotate the subspace before warping in order to enhance the representativeness of features.

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3. Writing a title for a paper

Write a title for the paper from which the above abstract is taken. (5 points)

4. Dividing a section into paragraphs

(20 points)

Insert paragraph symbols (¶) to divide the following three sections of a paper into paragraphs, and write a heading for each section. Then choose from the following phrases to complete the numbered gaps in the text. You may use a phrase more than once.

especially, for example, even though, but, however, also, but

Heading: _____

The hybrid VNS algorithm described has been shown to be a relatively straightforward but highly effective approach for this problem. It is particularly effective on medium and small sized instances with less than twenty nurses. It is a viable alternative to the existing genetic algorithm for the commercial workforce management and planning software Harmony and has been added alongside the genetic algorithm in the latest versions. For instances with less than twenty nurses, the VNS algorithm has been shown to regularly find superior schedules when compared against the genetic algorithm that is currently in use. For these sized instances, the VNS algorithm represents a significant improvement over a commercially successful methodology. It has (1) _____ found best known schedules for some of the scheduling periods (by running the algorithm for 12 hours). On instances with more than twenty instances, the VNS algorithm is competitive with the genetic algorithm and outperforms it on some instances. (2) _____, on average, the genetic algorithm is more successful on these larger instances. The shift unassignment and repair using heuristic ordering method has been shown to be an efficient and effective method of exploring the search space and when it is combined with the VNS, schedules of high quality can be found. It was (3) _____ discovered that back-tracking was very useful in finding better solutions more quickly by reducing the exploration of paths which only led to poor quality solutions.

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Heading: _____

(4) _____ the results produced by this algorithm are strong, there are areas in which it could possibly be improved and which need exploring,
(5) _____ if it were being designed to be run over a longer time period than 1 hour. (6) _____, after the VNS, when selecting the area of the schedule to un-assign shifts from, a simple method is used: Unassign the shifts belonging to a fixed number of nurses with the worst individual schedules. This is an obvious heuristic and has been shown to work well.
(7) _____, it is possible that there is a more effective method of selecting which, and how many, shifts to unassign and reassign using the heuristic ordering. It may (8) _____ be interesting to try replacing the VNS phase with tabu search or simulated annealing. A preliminary investigation revealed that a tabu search over a 1 hour period was not as effective as the genetic algorithm, (9) _____ if a longer time period is used it may be possible to achieve similar results using tabu search, (10) _____ if combined with the schedule disruption and repair method.

Heading: _____

This work was supported by EPSRC grant GR/S31 150/01. We thank the anonymous referees for their helpful comments and suggestions.

5. Rewriting a poorly written introduction (25 points)

Rewrite the following introduction, using the information in the original version.

We present a simple graphical technique that can be used to visualize how random a number generator which uses iterated function systems (IFS) is. To do this, you need a certain degree of mathematical sophistication and to use powerful computers, according to Voelcke (1988). In this paper, the authors used the chaos game algorithm (CGA), which Barnsley has described in 1992, to produce a visual representation of a sequence of random numbers. It uses iterated function systems to map a sequence of numbers into a subset of R^2 . Actually, a lot of the random number generators in use now are not very good, as indicated in the literature (Knuth 1981), (Park and Miller, 1998). Therefore, in many fields, the need for good random number generators has been recognized. Our technique is intended as

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a visual aid to more conventional statistically oriented methods, and it is easy to implement it on a PC.

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6. Writing an introduction section from notes

(30 points)

Use the following notes to write an introduction for the paper on which questions 2 and 3 are based.

Last several years, research on face recognition: focus = reducing impact of changes in

- a) lighting conditions,
- b) facial expression
- c) poses

Illumination-invariant face reco.

Two main approaches proposed:

1. Represent images with features less sensitive to illumination change (e.g., edge maps of an image). **Disadvantage:** edge features generated from shadows are related to illumination changes & may have big impact on reco.
2. Assumes surface of human faces Lambertian reflected, convex. Tries to construct low-dimensional linear subspace for face images taken under different lighting conditions.

Disadvantages:

- a) Hard for these systems to deal with cast shadows.
- b) Need several images of the same face taken under specific lighting source directions to construct a model of a given face. In many cases, hard to meet this reqt. (e.g. face images from historic photos).

Expression-invariant face reco.

Approaches:

1. Morph images to same shape as used for training. **Disadvantage:** not guaranteed that all images morphed correctly (e.g., image w. closed eyes cannot be morphed to neutral image ← lack of texture inside the eyes).
2. Use optical flow. **Disadvantage:** difficult to learn local motions within feature space to determine expression changes of each face ← different people express a certain feeling in different ways.

Martinez [6] proposed a weighting method that weights independently local areas less sensitive to expressional changes. **Disadvantage:** features insensitive to expression changes may be sensitive to illumination changes: see [5].

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Previous methods for

- a) illumination variations
- b) facial expression variations

can't compensate for both simultaneously.

→

We

1. present a new method, Adaptive Principal Component Analysis (APCA) to warp the face space by whitening + filtering eigen features acc. to the 2nd-order statistics of the samples.
2. further improve APCA by space rotation to enhance the representativeness of features.

Experiments show our method outperforms PCA [1] + Fisher Linear Discriminant (FLD) [2] in face reco w. both illumination + expression changes.

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QUESTION AND ANSWER SHEET

Examination, 31 January 2012

1. Parts of a paper

The following sentences are from the paper *Semantic Filtering of Video Content*. Which part of the paper do you think they come from? (Circle) the correct answer.

(10 points)

- (1) "Users of video databases want to find clips with high-level concepts like *explosion, beach, car, mountain*, etc. To support such queries, we use a *multiject*."
 - A. Introduction
 - B. Methods
 - C. Results
 - D. Discussion
- (2) "We have used a Bayesian multinet to model the interaction between semantic concepts. This leads to a substantial improvement in detection performance."
 - A. Introduction
 - B. Methods
 - C. Results
 - D. Discussion
- (3) "Figure 5 shows the ROC curve for the overall performance across all the five multijects."
 - A. Introduction
 - B. Methods
 - C. Results
 - D. Discussion
- (4) "Research in audio has been focussed on speech, with significant success. However, non-speech audio has been insufficiently addressed."
 - A. Introduction
 - B. Methods
 - C. Results
 - D. Discussion
- (5) "Improvement in detection (P_d) is more than 20% for a range of thresholds corresponding to small probability for false alarms (P_f)."
 - A. Introduction
 - B. Methods
 - C. Results
 - D. Discussion

QUESTION AND ANSWER SHEET

2. Paragraph patterns

Suggest a logical pattern (e.g., “time sequence”, “general to particular”, “cause and effect”, etc.) for each of the following paragraphs **(16 points)**

(1) Today, there is a mind shift in business communities, in scientific endeavors, in philosophical views, in psychology, in technology, and in international relationships from seeing parts to seeing wholes. This approach has been termed *systems thinking*. It looks at “patterns of change rather than snapshots” (Senge, 1990, p. 68). This new way of thinking was first used by biologists, and was later supported by research in quantum physics, ecology, and psychology. Essentially, systems thinking emphasizes thinking in terms of connectedness, relationship, and context (Capra, 1996). The essence of systems thinking involves a mind shift from parts to the whole and to learning the relationship among the parts within different contexts.

Logical pattern: _____

(2) When instructional design is viewed from two levels, instructional content and the conceptual structure of a discipline, learning is achieved at a higher level. These subconscious themes or conceptual structures will allow learning of external knowledge to be transformed into internalized knowledge. Therefore, approaching instructional design in this fashion allows the transformation of taxon memory into locale memory, which is a natural way of learning.

Logical pattern: _____

(3) When the user opts to insert a menu or choice, a dialog box will pop up, asking the user to specify the text of the menu choice, which character is the shortcut (this character will be underlined when the menu is displayed), if there is a keyboard shortcut (such as Ctrl+X), and what Ada procedure should be called when this item is selected. When the user closes the menu editor, the menu will be updated and redisplayed.

Logical pattern: _____

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(4) Computer programs are becoming increasingly visual. Unfortunately, graphical interface programming tends to be both highly complicated and system-dependent. Various languages and graphical user interface (GUI) design tools have been developed to simplify this process. RAPID (the Rapid Ada Portable Interface Designer) is the first free, multi-platform, GUI design tool written entirely in and for Ada. By using the RAPID toolset, the programmer can quickly lay out a user interface through a visual design process, then have the toolset automatically generate Ada code that will create that interface.

Logical pattern: _____

3. Underline the hedging phrases in this passage that the author has used to qualify his statements. **(14 points)**

The intended outcome of this paper was to establish some form of theoretical base for the production of computer based instruction materials. While the whole issue of instructional design was found to be somewhat clouded with numerous debates raging over major issues such as the instructional paradigm to be adopted and the effectiveness of user control, it has been possible to establish a number of criteria which appear to be valid.

In this paper, a theory of storing knowledge as mental models was developed so as to form a basis for evaluating the various ideas, concepts and theories encountered in the literature. In my opinion, this theory has stood up well and would appear to be close to the semantic network or schema theory as described by Jonassen (1988). To develop such a mental structure, it would appear that a constructivist instructional approach must be taken as behaviourism would lead to a knowledge base which is somewhat fragmented rather than a well structured model.

However, a behaviourist approach cannot be totally disregarded. As Jonassen (1991) argues, by its very nature, training often demands that a behaviourist approach be taken. Also, Spiro et al. (1990, 1991) state that different instructional strategies are required for novice and advanced learners and it could be suggested that a behaviourist approach could be well suited to the acquisition of basic skills. Figure 1 attempts to indicate where a particular type of educational software may be appropriate in the instructional process.

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4. Connecting sentences

Join the following sentences into a paragraph by using connecting words such as *and*, *but*, *if*, *when*, *or*, *because*, and *which*, with appropriate punctuation.

(10 points)

Face recognition

- a. You approach a high-security network.
- b. Key features of your face are scanned
- c. The system matches your features to a database record of authorized staff.
- d. Your identity is verified.
- e. You can log on.
- f. Your identity is not verified.
- g. You cannot use the system.

(Write your paragraph here.)

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5. Use the following notes to write two paragraphs for the Related Research section of a paper. (50 points)

2.1 Schooling in Fish

Biologists – schooling behaviour – several hypotheses:

- (1) Reduce risk of being eaten [PAR82, SHA62, PIT86]
- (2) Mating efficiency
- (3) Easier to find food
- (4) Good environment for learning/reducing overall aggression [BILL76]
- (5) (Acc. to some studies) save energy (reducing drag → improved hydrodynamic performance) (**but** contradictory opinions, no conclusive results [BILL76, PAR79])

Schooling seems to obey distrib. model rules (each individual applies same set of simple behavioural rules). Each fish:

- (1) Takes into account fish in neighbourhood.
- (2) Pays more attention to closest ones
- (3) Tries to match velocity, direction with neighbours [PAR82, SHA62]
- (4) Tries to maintain constant distance betw. self/close neighbours.

(Write your paragraphs here.)

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