

Study on Case Optimization of Pattern recognition Curriculum Task Driven Teaching

Duanyuan Bai ^a, Chenjie Zhang

Changchun University of Science and Technology, Changchun, P. R. China.130022, China

^abdybai@hotmail.com

Abstract

This paper discusses task driven method using optimization of the task case in the Pattern Recognition course teaching. Discusses the optimization strategy in the task of setting up a reasonable use of multimedia resources, so that students feel the characteristics of the classification method in the classroom, thus triggering the student's thinking and learning interest. Pay attention to the teaching effect evaluation of task driven teaching, promote mutual evaluation between groups, not as a practice, one debate, the greatest degree to play the advantage of the task driven teaching mode.

Keywords

Pattern Recognition; task driven teaching method; optimization strategy; teaching assistant software.

1. Introduction

Pattern recognition is a subject that has developed rapidly in the 60's, and it is used to classify the physical objects or the abstract multidimensional pattern into the categories of known or unknown. As the pattern recognition is a subject which is closely combined with practice, the theoretical basis involves advanced mathematics, linear algebra, mathematical statistics, small sample statistical learning theory, fuzzy mathematics and other disciplines, so the course has a certain degree of abstraction and difficulty, students are not easy to understand its content. We introduce the task driven teaching mode in the teaching practice, the combination of theory and practice, to carry out a task topic, the establishment of advanced step by step to the classroom problems, experimental contents and operation. Practice has proved that this teaching method greatly improves the students' enthusiasm for learning. How to set up the task has become the key to achieve good teaching effect. Advocated in this paper, using multimedia and auxiliary teaching software optimization task set up process, take teaching as a dark line, through to the task. Use the obvious characteristics of multimedia and computer assisted instruction software, such as visual, audible, fully mobilize the students to complete the task, to solve the problem of enthusiasm, thus in entertaining atmosphere to cultivate students professional ability.

Task driven teaching method is a teaching method to teach people how to fish. In the task driven teaching method, it is clear that the specific task is the premise, the analysis of the task to form a solution is the key, in the autonomous learning and collaborative learning to complete the task is the focus, the final evaluation of the learning effect, the formation of feedback information is summed up to improve the stage. Each link must be arranged in a reasonable balance. Of course, task driven teaching thought is to break down the new knowledge into some tasks, it is inevitable to ignore the systematic and integrity of knowledge. In order to overcome this weakness, first of all, the task is put forward to grasp, pay attention to overall design, so that between the task and the task, the old and new knowledge. Secondly, in a unit or a chapter of learning, it is necessary for teachers to guide students to

learn knowledge in a timely summary of induction, in order to form the knowledge of the system. In this way, the realization of the task can deepen the understanding of the old knowledge, to complete the real sense of knowledge construction, to achieve the purpose of cultivating innovative spirit and innovative ability.

2. Optimization of the task driven teaching case

"Task driven teaching method" is a teaching method based on constructivism learning theory. It transforms the traditional teaching idea to solve the problem, to complete the task based multi-dimensional interactive teaching concept, to make the students in a positive learning state, each student can according to their own understanding of the current problem, the use of common knowledge and their own unique experience to solve the problem. We introduce the multimedia and auxiliary teaching software in the traditional task driven teaching method, take the task as an open wire, using simulation software, and other ways to strengthen the cultivation of students' knowledge and skills of the dark line of. Here we give an example to illustrate the implementation of the task driven teaching case of optimizing teaching cases.

2.1 The structure of task driven teaching case establishment

Task driven teaching case set up principle is to be able to use one or several throughout the outline of the core content of the task, which is conducive to the introduction of knowledge points, the theory and practice, is a solid grasp of students, flexible use. Let the students complete the specific task, realize the knowledge point of the study and application. The overall framework of the task driven teaching model is shown in figure 1.

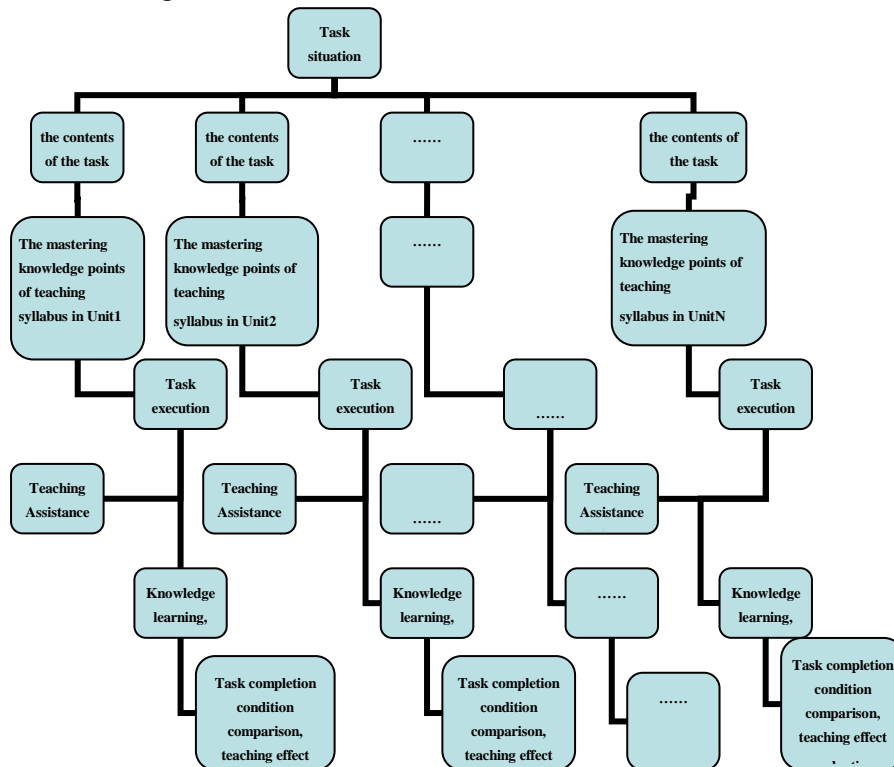


Fig.1. Structure of task driven optimization teaching case

3. Optimization of task driven teaching case

3.1 Example of the task driven teaching case optimization

During statistical pattern recognition teaching, you can select the fruit image recognition, ECG recognition, speech recognition and identification of the RMB as a case. The following is based on the

identification process of handwritten numeral as an example to discuss the case optimization method of the statistical pattern recognition based on Bayesian decision theory. The judgment process is used as shown in figure 2.

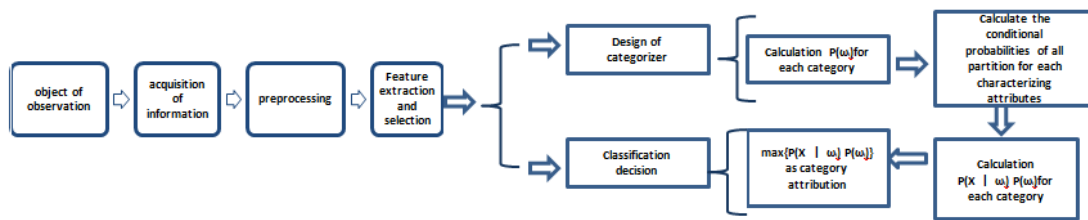


Fig.2. Bias classification process

Case optimization ideas are as follows:

1, Establish of a teaching aid software platform for teaching demonstration. Here choose GUI Matlab to achieve. Teaching assistance software integrates the source program of a variety of classifier design method using Bayes classification

2, Task arrangement

(1) Classroom theory teaching. This part introduces the basic knowledge of Bayesian decision theory combines the task situation of handwritten character recognition.

(2)Introducing the situation and the task. For the teaching of Bayesian theory, such as maximum a posteriori probability criterion, minimum risk decision criterion , setup the task situation use the case of handwritten character recognition. Students are required to complete the program flow chart (its form can be grouped work, grouping experiment).

3, Completion the task. To accomplish the task of self inquiry and cooperative learning in the form of grouping.

4, Task evaluation. Carry out the evaluation activities on task results ,between teacher and students, students and students.

5, The extension of the task results. 1 of the software platform to be built in the students to share, inspire students to continue to improve and explore their own task.

3.2 Task driven teaching optimization case software platform

Figure 3 shows the software platform of core content of the Bayesian decision theory.The software include the source programs of the maximum posteriori decision criterion, minimum risk decision criterion ,and the source programs of other classifiers using knowledges in other chapters.The software platform also integrated 0~10 number 5*5 sample library.All of these, support for students to use the task results for the subsequent in-depth study.

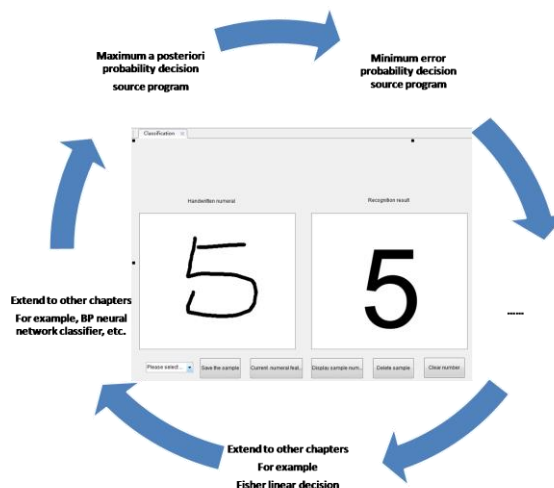


Fig.3. Matlab GUI teaching aids platform

4. Conclutions

This paper emphasizes the establishment of the task driven optimization case based on multimedia and simulation software, which can exert the advantage of the task driven teaching mode to a greater extent. Focus on task driven teaching effect evaluation, to take the way of classroom teaching for students to peer assessment program, the discussion between the group will make the teaching effect to be supplemented and sublimation. Learning one hundred times can not better than a practice, practice one hundred times can not better than a discussion. The task driven teaching method of case optimization supports the students to continue to development the task completion, which has far-reaching significance for students to continue to study in depth. Case optimization task based teaching method is beneficial to the students' knowledge system of Automation Technology and Application. Facts have proved that the task driven teaching method can get better teaching effect.

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