Model of Intelligence

Hui Liu
0000-0003-4706-4768

Abstract
This paper explores the basic composition and operational mechanisms of intelligent systems. Intelligence is defined as the ability to solve problems, and the operation of intelligent systems is centered around databases. The three fundamental elements of intelligent system operation include the construction, retrieval, and use of databases. This paper discusses in detail the process of handling a single event in a single thread. Complex event composites can be broken down into multiple single events for resolution.

Keywords: Intelligent Systems; Databases; Knowledge Trees; Event Processing

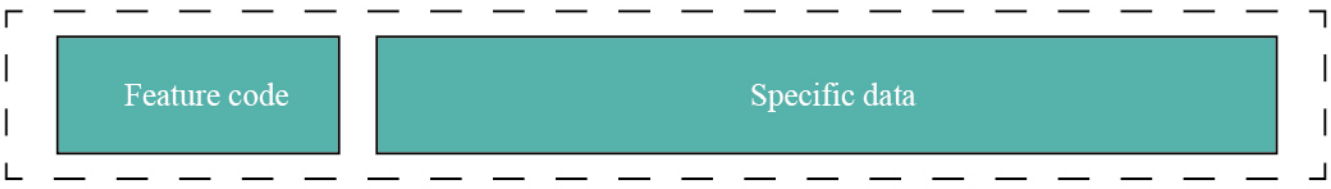
Databases

Intelligence is a complex capability, often defined as the ability to solve problems. Intelligent systems operate based on databases. The operation of intelligent systems includes three basic elements: establishing a database, retrieving the database, and utilizing the data. (Figure 1)

Figure 1 Three basic elements

Knowledge systems typically use a tree-structured database known as the "knowledge tree." Each data item consists of two parts: a feature code and specific data. The feature code is used for retrieval, while the specific data stores detailed information. (Figure 2)

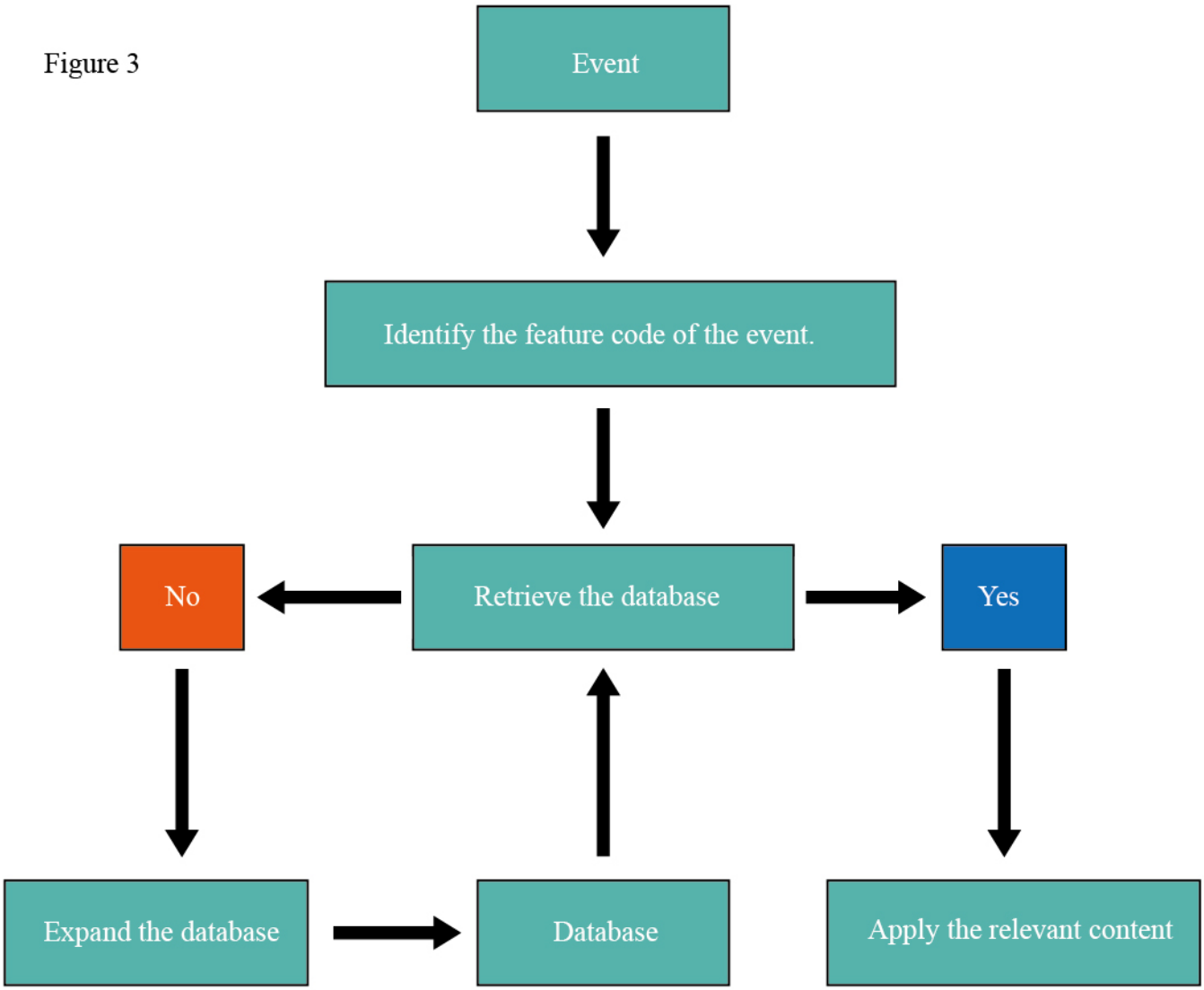
Figure 2. Each data item consists of two parts: a feature code and specific data.



Intelligent System Event Processing Flow:

1. Identify the feature code of the event.
2. Use the feature code to retrieve the database.
3. If a complete match is found, apply the relevant content of the matching data.
4. If a complete match cannot be found, expand the database.(Figure 3)

Figure 3

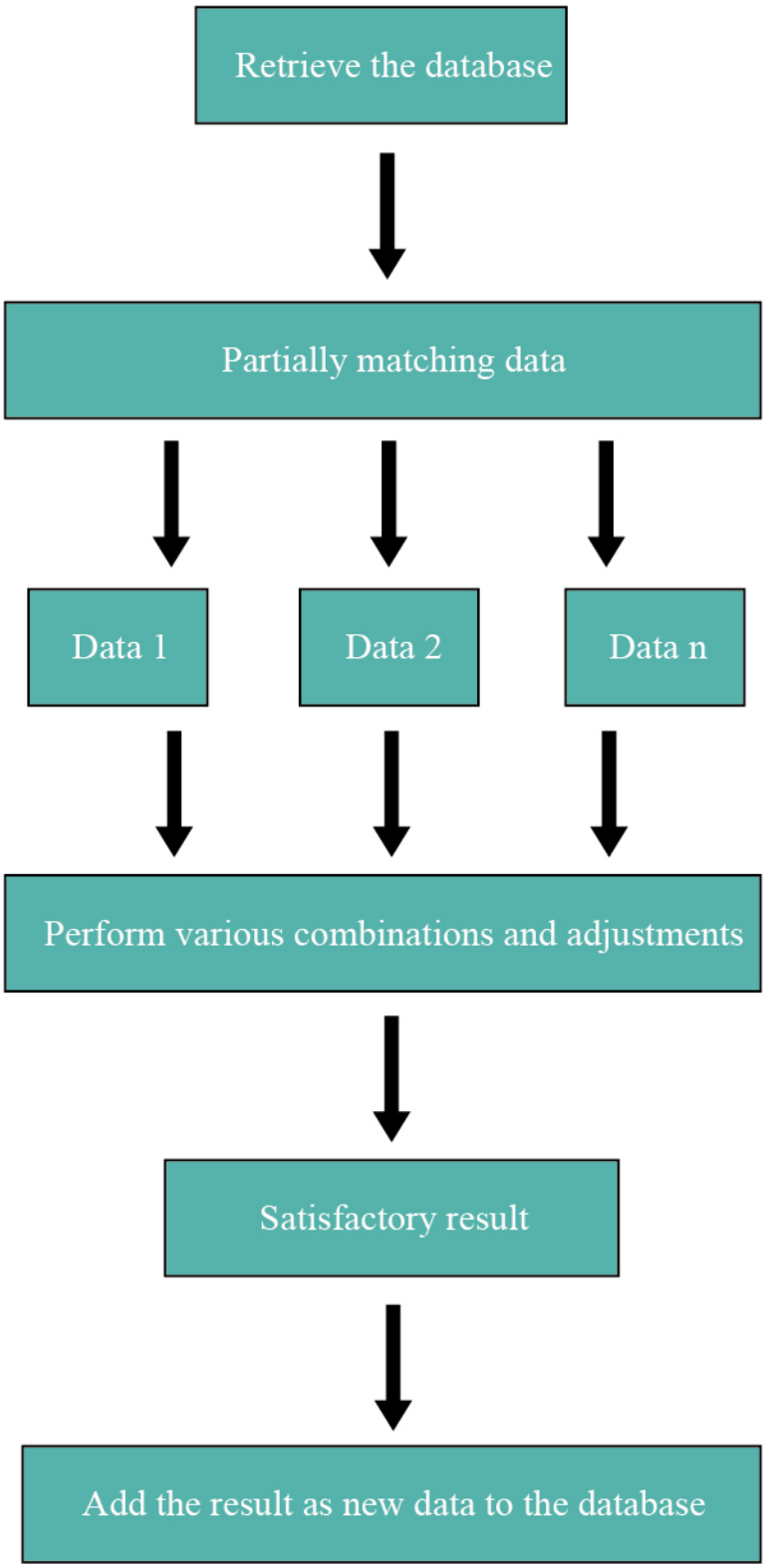


On Database Expansion

Method 1: Copy data from other databases.
Method 2: Innovation, with the following specific steps:

1. Use the event's feature code to retrieve the database (all accessible databases), obtaining some partially matching data.
2. Analyze these partially matching data, identify the elements they contain, and perform various combinations and adjustments until a satisfactory result is achieved.
3. Add the result as new data to the database. (Figure 4)

Figure 4 Expand the database



Complex Problem Handling

The above discussion pertains to the single-threaded processing of a single event. However, problems in the real world are often complex problem composites that require the complex problem to be broken down into multiple single events, which are then solved one by one using a single-threaded method. Therefore, most solutions of intelligent systems are multi-threaded.