COM-Based Symbol Design and Implementation in Arc/Info GIS

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Map symbols play a very important role in the visualizing of GIS data. There are different symbol specifications in different countries or regions. So implementing the symbol design to meet with the country or region standard is the first and most important step in a GIS project. But there are some special symbols that can't be designed using the tools provided by the GIS software platform such as Arc/Info. COM (component object model) technologies provide a flexible approach to design all kinds of special symbols in COM-based applications of GIS. This paper discusses the principles in the design of special symbols in the GIS project and implementing the special symbols design system in a component-based GIS environment, which complete the design of special symbols (such as electric line) specified by the Chinese national terrain map symbols standard. All the functionalities are implemented using the program language Microsoft Visual C++ 6.0. Firstly we defined four components as following: PointSymbol, LineSymbol, AreaSymbol and MarkerSymbol. Secondly I implemented the correspondence Interfaces for each of the four component such as ISize, IGeometry and so on. In addition to the above interface, I defined the special interface for specific component. For example I defined the IDistance Interface for the LineSymbol component to determine the distance from a marker symbol to a point at which the line direction is changed(such as electric line and so on).Based on the defined interfaces I defined the methods and attributes to implement the parameters design of the symbols. At the same time I used the feature of 'type inherit' of COM to implement the component reuse for the common interface such as Icolor and so on. Meanwhile the concepts of 'aggregation' and 'containment' are used in the design and implementation of the symbol system. Although I implement only the special symbols used in china in Arc/Info GIS, the method has general significance. The method COM-based symbol design and implement is researched and implemented for the first time. I believe the usage of COM technology in GIS field is endless and the COM-based symbol design and implement will significantly improve the technology development of the visualizing of GIS data.