

Articulate: a Conversational Interface for Visual Analytics



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Motivation

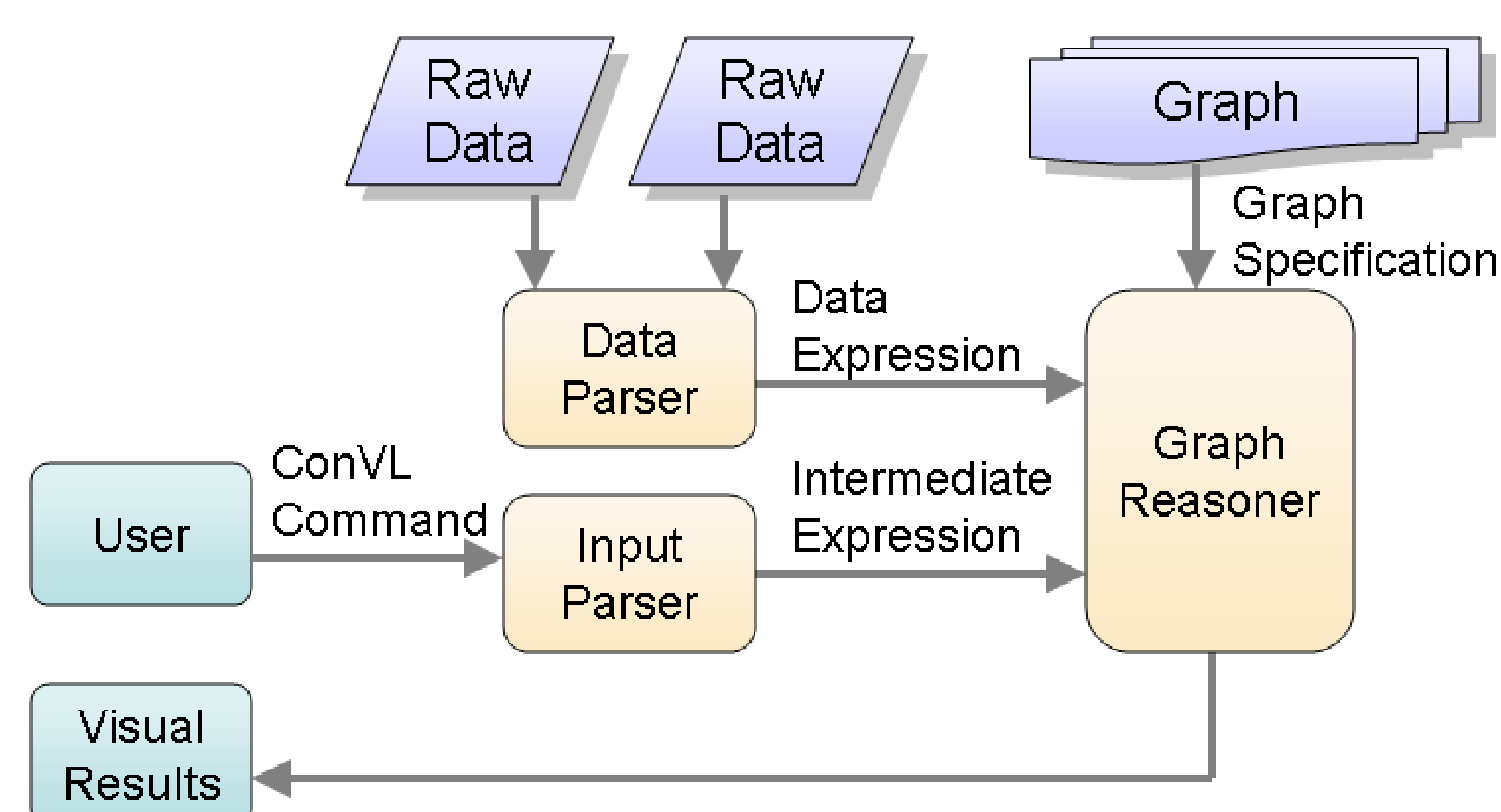
Visual analytic tools have been used in a variety of disciplines to synthesize information and derive insight from abstract datasets. The users of such tools are usually domain experts with marginal knowledge of visualization techniques. These users often experience difficulties when trying to manage visual parameters. To relieve the users of the physical burden of manipulating a complex user-interface, by instead allowing them to verbally articulate what they want to see in a brief manner, we propose: *Articulate*, which:

- incorporates an novel user interface based on ConVL, a high-level visualization language.
- integrates data properties and user's requirement to automatically generate visual representation.

2007 NSF Visualization Workshop Report Recommendation: "There is a strong desire for conversational interfaces that facilitate a more natural means of interacting with the science."

Approach

Articulate is a semi-automated visual analytic model. The main idea of this model is to integrate the user's requirements and data properties, using natural language processing and heuristics to automatically create an appropriate visual result.

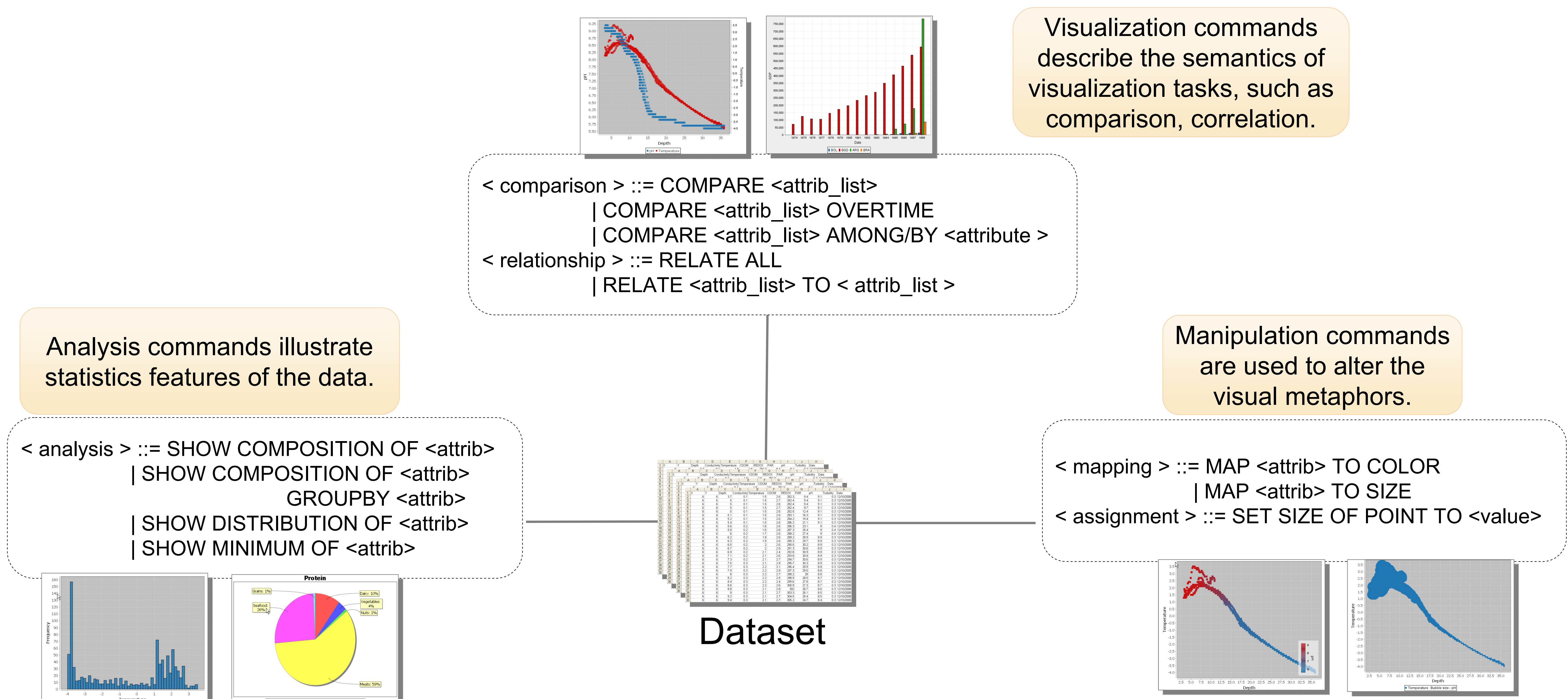


In our model there are three major components:

- ConVL Input Parser: translates the ConVL command.
- Data Parser: reads the original data file searching for data fields.
- Graph Reasoner: funnels the information about data, user's input and graph types to determine the most appropriate visualization.

Conversational Visualization Language

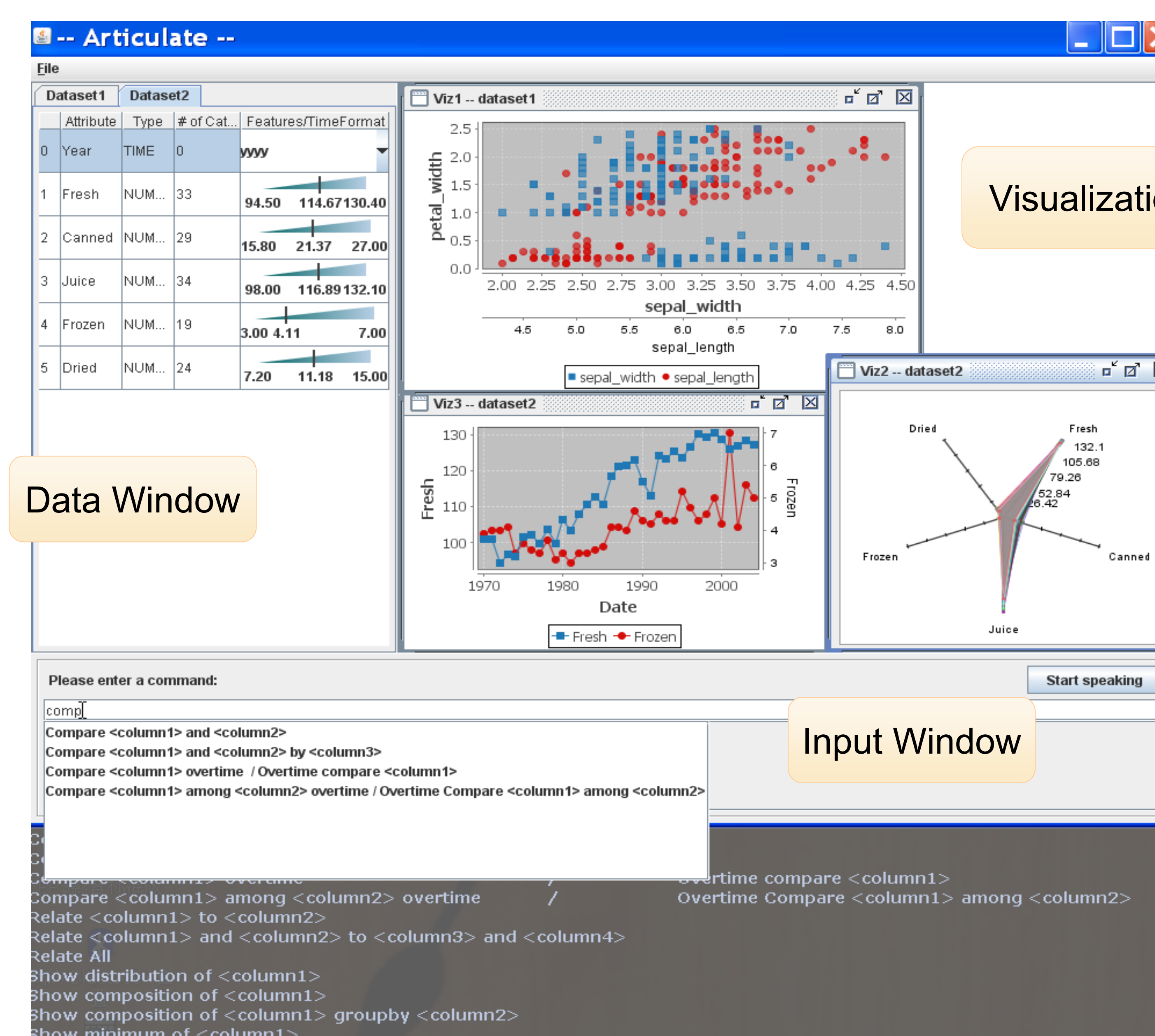
ConVL is a high-level script language specified in a formal grammar. To accommodate the different purposes of visual analytics, ConVL is divided into three major categories: visualization command, manipulation command and analysis command.



Interface

Visualization Panel shows each visual representation in a separate view.

Data Window lists all the data fields such as attribute names, data types and statistics features.



Input Window accepts ConVL commands via the speech recognition interface or the command line input. Its auto-suggestion function helps user choose an appropriate command.

Future directions include the integration of natural language processing and artificial intelligence techniques to accommodate a wider range of semantically equivalent commands, and to enable the system to converse with the user to produce personalized results.