Abstract. This paper reports our current work on Pythonissa, a visual language tailored to graphically describe weather forecast bulletins. The internal representation of a bulletin is a sequence of graphs and visual sentences are therefore represented as graph transformations. Pythonissa is being implemented as part of a more generic framework, based on the well-known visualization software Vis5D, and using the scripting language Python.

1 Motivation

Weather forecasting dramatically evolved in the recent years thanks to numerical prediction models and to a world-wide infrastructure of data acquisition and distribution. In spite of the quality of models, however, preparation of forecasts is still a job for experienced meteorologists (forecasters) which need to analyze model results and many other kind of information before writing a bulletin. Since the volume of data to explore is increasingly high, forecasters routinely resort to visualization tools. The normal result of that process is a textual bulletin, inadequate for modern image-oriented media like TV and WWW. Even for the press, a graphical representation of the forecast for sure is more attractive.

To make forecast preparation easier and faster, forecasters should use a single, integrated software tool which allowed themselves to simultaneously observe the available data and draw forecasts over them. Currently, AFPS [1] provides such environment, but our aim is to produce a tool with which forecasters can also generate the text bulletin from the drawn one.

2 A formally-specified visual language

Drawings are normally a kind of non- or poorly-structured data, but to generate the forecast text we need to assure that meteorologists could not draw invalid forecasts. So, the bulletin must be internally represented in a parsable form. The adopted solution was modeling the bulletin as a sequence of graphs and use Graph Grammar techniques to parse them. Figure 1 shows an example.

Composing the bulletin is then reduced to the task of laying out it’s elements over the visualized data using direct manipulation techniques.

3 A general-purpose framework

Instead of writing a whole application to support the new language, we decided to include it as a feature in an existing visualization tool, Vis5D [2]. To make such task easier we also incorporated to Vis5D the scripting language Python, which provides object-oriented programming and extensibility, and replaced its graphical user interface by a new one, based on the industry standard toolkit Motif.

The result of our work will be a general-purpose framework that we decided to call Py5D, meaning ”merging of Pythonissa with Vis5D”. The name of the visual language is a pun involving Python and the Latin term Pytonissa, which designates a woman who practices divination (prophecies).

Acknowledgements

We are thankful to CAPES for the scholarship provided to Carlos Santos while at UFRGS. Thanks also to Dr. Leila Ribeiro (UFRGS) for her help in understanding of the theoretical concepts of graph grammars.

References
