

Preface

Visual languages have long been a pursuit of effective communication between human and machine. Today, they are successfully employed for end-user programming, modeling, rapid prototyping, and design activities by people of many disciplines including architects, artists, children, engineers, and scientists. Furthermore, with rapid advances of the Internet and Web technology, human-human communication through the Web or electronic mobile devices is becoming more and more prevalent.

This manuscript provides a comprehensive introduction to diagrammatical visual programming languages and the technology of automatic generation of such languages. It covers a broad range of contents from the underlying theory of graph grammars to the applications in various domains. The contents were extracted from the papers that my Ph.D. students and I have published in the last 10 years, and are updated and organized in a coherent fashion. The manuscript gives an in-depth treatment of all the topic areas. Pointers to related work and further readings are also facilitated at the end of every chapter except Chapter 9.

Rather than describing how to program visually, the manuscript discusses what are visual programming languages, and how such languages and their underlying foundations can be usefully applied to other fields in computer science that need graphs as the primary means of representation.

Assuming the basic knowledge of computer programming and compiler construction, the manuscript can be used as a textbook for senior or graduate computer science classes on visual languages, or a reference book for programming language classes, practitioners, and researchers in the related field.

The manuscript cannot be completed without the helps of many people. First of all, I am very grateful to Shi-Kuo Chang, a pioneer of visual languages and one of the greatest computer scientists and Chinese novelists, for writing a foreword for this manuscript. I would like thank my past and present Ph.D. students who have contributed to its rich contents, particularly Jun Kong, Guanglei Song, Da-Qian Zhang, and Chunying Zhao. My thanks also go to Maolin Huang (University of Technology, Sydney,

Australia) for allowing me to apply his work to Web visualization and browsing; and to Xiaoqin Zeng (Hohai University, China) for his contribution to the generalization of Reserved Graph Grammars. Publishers of the original papers including IEEE, Oxford Press, and Springer are acknowledged for their permission to reuse the contents previously published in their respective journals and conferences. Finally, I would like to thank Susan Lagerstrom-Fife and Sharon Palleschi at Springer USA for their assistance in publishing this manuscript in a timely fashion.

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