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.

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