Preface

Researchers in software visualization develop and investigate methods and use of computer-graphical representations of different aspects of software such as its static structure, its concrete or abstract execution as well as its design and evolution.

Since Goldstein's and von Neumann's demonstration of the usefulness of flowcharts in 1947 visual representations have played an important role in understanding and designing programs. Software visualization is done in many areas of computer science, but often not realized as a field of its own. As a result papers are published at conferences and workshops of these areas reinventing the wheel over and over again.

The planning for this book started at the Dagstuhl Seminar on Software Visualization during May 2001. The goal of this seminar was to bring together practitioners and researchers working in the area of software visualization as well as those working in related areas including database visualization, graph drawing, and visual programming. Discussions and presentations at the seminar were not restricted to theoretical foundations and technical applications. They also addressed psychological and educational aspects.

The intent of this book is to present the state of the art in software visualization. To this aim it contains introductory papers and original work. More than 60 authors contributed to this volume. It is divided into five chapters:

 – algorithm animation,
 – software visualization and software engineering,
 – software visualization and education,
 – graphs in software visualization,
 – and perspectives of software visualization.

Each chapter starts with an introduction surveying previous and current work and providing extensive bibliographies.

Eventually we hope that this volume will foster software visualization and its impact on the way we teach, learn, and design programs.

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December 2001   Stephan Diehl

Foreword by the Organizers

The International Dagstuhl Seminar on Software Visualization was held in May 2001 at the International Research and Conference Center for Computer Science in Schloss Dagstuhl, Germany. Dagstuhl seminars are one-week meetings which bring together the most significant researchers on important topics in computer science. Participation is by invitation only.

It is often said that humans have never before created any artifacts which are as complex as today's software systems. As a result creating, maintaining, understanding, and teaching software is a challenging task. Software is neither matter nor energy, it is just a kind of information. Sometimes the representation and the information itself are confused. Software visualization is concerned with visually representing different aspects of software including its structure, execution, and evolution. So far, research on software visualization has mostly been motivated by its potential to support teaching. Many systems have been developed to facilitate the production of algorithm animations. At Dagstuhl software engineers and re-engineers have repeatedly argued that there is a strong need for software visualization in their areas. Here further research includes the use of techniques from information visualization to display software metrics, graph layout and graph animations to show the structure and changes in software systems, and program animation for debugging. At the seminar more than 50 researchers from all around the world discussed the state of the art as well as challenging questions for the future of software visualization. The program included 38 presentations and 15 system demonstrations, as well as several sessions for group discussions. Participants of the seminar volunteered

- to compile a post seminar proceedings, which is to be published as a Springer LNCS state-of-the-art survey,
- to create a repository with algorithm animations, and software visualization tools
- to initiate an international conference series on software visualization.

We feel that the seminar was a seminal event. The future will tell whether it reached its ambitious goals to form a community and raise awareness of software visualization as a challenging and important research field of its own.

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