Data Flow Analysis: Theory and Practice

By Uday Khedker, Amitabha Sanyal, Bageshri Sathe

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Data flow analysis is used to discover information for a wide variety of useful applications, ranging from compiler optimizations to software engineering and verification. Modern compilers apply it to produce performance-maximizing code, and software engineers use it to re-engineer or reverse engineer programs and verify the integrity of their programs.

Supplementary Online Materials to Strengthen Understanding

Unlike most comparable books, many of which are limited to bit vector frameworks and classical constant propagation, **Data Flow Analysis: Theory and Practice** offers comprehensive coverage of both classical and contemporary data flow analysis. It prepares foundations useful for both researchers and students in the field by standardizing and unifying various existing research, concepts, and notations. It also presents mathematical foundations of data flow analysis and includes study of data flow analysis implantation through use of the GNU Compiler Collection (GCC). Divided into three parts, this unique text combines discussions of inter- and intraprocedural analysis and then describes implementation of a generic data flow analyzer (gdfa) for bit vector frameworks in GCC.

Through the inclusion of case studies and examples to reinforce material, this text equips readers with a combination of mutually supportive theory and practice, and they will be able to access the author's accompanying Web page. Here they can experiment with the analyses described in the book, and can make use of updated features, including:

- Slides used in the authors' courses
- The source of the generic data flow analyzer (gdfa)

- An errata that features errors as they are discovered
- Additional updated relevant material discovered in the course of research

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Editorial Review

Review

…provides a very decent and quite balanced coverage of the topic from a formal perspective. It is well written and nicely organized, containing many examples which definitely help to clarify the rather technical content. All the chapters end with a summary and concluding remarks, as well as bibliographic notes, pointing to further readings. This book also comes with a live web page…that contains slides with some additional material, [an updated] Errata section… and the analyzer software. This book includes an introduction to GCC, a rich list of references, and an index.

--Zhjzhang Shen, Plymouth State University

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Mary Ayala:

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