

Farmer

Simple Type Theory

A Practical Logic for Expressing and Reasoning About Mathematical Ideas

This unique textbook, in contrast to a standard logic text, provides the reader with a logic that can be in practice to express and reason about mathematical ideas. The book is an introduction to , a classical higher-order version of predicate logic that extends first-order logic.

It presents a practice-oriented logic called that is based on Alonzo Church's formulation of simple type theory known as . Unlike traditional predicate logics, Alonzo admits undefined expressions. The book illustrates using Alonzo how simple type theory is suited ideally for reasoning about mathematical structures and constructing libraries of mathematical knowledge. For this **second edition** , more than 400 additions, corrections, and improvements have been made, including a new chapter on inductive sets and types.

Topics and features:

- Offers the first book-length introduction to simple type theory as a predicate logic
- Provides the reader with a logic that is close to mathematical practice
- Includes a module system for building libraries of mathematical knowledge
- Employs two semantics, one for mathematics and one for logic
- Emphasizes the model-theoretic view of predicate logic
- Presents several important topics, such as definite description and theory morphisms, not usually found in standard logic textbooks

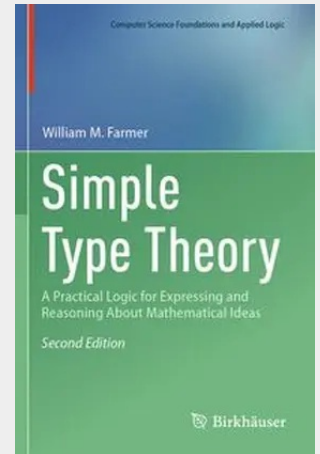
Aimed at students of mathematics and computing at the graduate or upper-undergraduate level, this book is well suited for mathematicians, computing professionals, engineers, and scientists who need a logic for expressing and reasoning about mathematical ideas.

William M. Farmer is a Professor in the Department of Computing and Software at McMaster University in Hamilton, Ontario, Canada.

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