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Preface

The papers of this volume were presented at the fourth biennial Summer Conference on Category Theory and Computer Science, held in Paris, September 3-6, 1991.

The proceedings of the previous three conferences (Guildford 1985, Edinburgh 1987 and Manchester 1989) also appear in the Lecture Notes in Computer Science, as Volumes 240, 283 and 389.

Category theory, as well as other more specific algebraic, topological or geometric structures, continues to be an important tool in foundational studies in computer science.

Category theory, after having played a major role in the development of mathematics (e.g. in algebraic geometry), has been widely applied by logicians to get concise interpretations of many logical concepts. On the other hand, links between logic and computer science have been developed now for over twenty years, notably via the so called Curry-Howard isomorphism, which identifies programs with proofs, types with propositions. Together, the triangle category theory-logic-programming presents a rich world of interconnections.

Selected topics covered in this volume are the following:

- Type theory: Stratification of types and propositions, in relation to the distinction compile time - run time, can be discussed with precision in a categorical setting.
- Domain theory: Synthetic domain theory develops domain theory internally in the constructive universe of the effective topos: thereby many properties come for free. Stone Duality applied to computer science gives a duality between properties and denotations of programs. This approach is now applied to stable functions, an intermediate between parallel and sequential semantics notions.
- Linear Logic: This reconstruction of logic based on propositions as resources leads to alternatives to traditional syntaxes. Links with MacLane-Kelly coherence in monoidal closed categories have been found, deepening the understanding of both coherence and linear logic.

The organisers would like to thank the Ministère de la Recherche et de la Technologie, the Centre de la Recherche Scientifique and the Ministère de l'Education Nationale of France for their support. We would like to thank Chantal Butery for the local organisation of the meeting, and Debbie Murrells for invaluable editorial assistance in the preparation of this volume.

July 1991

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