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Advanced Functional Programming

Second International School
Olympia, WA, USA, August 26-30, 1996
Tutorial Text



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Preface

This volume presents the lectures given at the second international school on *Advanced Functional Programming*, held August 26-30, 1996 at Evergreen College in Olympia, Washington. The summer school is the successor of the spring school on *Advanced Functional Programming*, held May 25-30, 1995 in Båstad, Sweden. The notes of the first school are also available from Springer-Verlag (LNCS 925).

Why have a series of schools on advanced functional programming? After many years of development, functional programming languages have matured to a point where they can be used for much larger applications than has been typical in the past. In order to take advantage of the power of functional programming, students need to be able move past the elementary concepts, and progress towards programming in the large. Students need to know what functional languages have to offer in this context and how best to structure software to achieve good engineering.

The lectures cover a wide range of topics. Half of them address application programming: structuring GUIs in a compositional manner, building efficient and error correcting parsers, and implementing concurrent threads using first-class continuations, through to modelling music scores and driving synthesizers. The other half address meta-issues in programming: using ML modules to capture the architecture of software, enriching the concept of polymorphism to describe structure-independent programming, building efficient functional data structures, and techniques for reducing the space required by a program.

The notes use Haskell and Standard ML. However, many of the techniques and principles presented here are not relevant to functional programming alone, but may apply equally well to executable specification languages, and to algorithm design in imperative languages.

We are very grateful to the lecturers, all world-class researchers in functional programming, both for the time and effort they devoted to the production of these notes, and for their lectures and exercises during the school itself.

We would like to thank a number of other people as well: Al Leisenring, Lynette Osborne, Kelly Atkinson, Patti Johann, Alex Kotov, Walid Taha, and Byron Cook. Without their help it would have been far harder to organize the school.

The school was sponsored by the Pacific Software Research Center (PacSoft) at the Oregon Graduate Institute (OGI), and also received financial support from the National Science Foundation. The web-page for the summer school can be found at <http://www.cse.ogi.edu/PacSoft/summerschool196>.

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