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# Programming Languages and Systems

Second Asian Symposium, APLAS 2004  
Taipei, Taiwan, November 4-6, 2004  
Proceedings

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# Foreword

On behalf of the organizing committee I would like to welcome you all to the second Asian Symposium on Programming Languages and Systems (APLAS 2004) held in Taipei on November 4–6, 2004. Since the year 2000, researchers in the area of programming languages and systems have been meeting annually in Asia to present their most recent research results, thus contributing to the advancement of this research area. The last four meetings were held in Singapore (2000), Daejeon (2001), Shanghai (2002), and Beijing (2003). These meetings were very fruitful and provided an excellent venue for the exchange of research ideas, findings and experiences in programming languages and systems. APLAS 2004 is the fifth such meeting and the second one in symposium setting. The first symposium was held in Beijing last year.

The success of the APLAS series is the collective result of many people's contributions. For APLAS 2004, first I would like to thank all the members of the Program Committee, in particular the Program Chair Wei-Ngan Chin, for their hard work in putting together an excellent program. I am most grateful to invited speakers, Joxan Jaffar, Frank Pfenning, and Martin Odersky, who have traveled a long way to deliver their speeches at APLAS 2004. I would like to thank all the referees, who helped review the manuscripts, the authors, who contributed to the proceedings of APLAS 2004, the members of the Organizing Committee, who made considerable effort to organize this event, and all the participants present at this meeting. Without your support this symposium would not have been possible. Finally I would like to acknowledge the support of the Asian Association for Foundation of Software and Academia Sinica, Taiwan.

I am sure you will enjoy this meeting, and I hope you will also find time to do some sightseeing in Taipei and take back some fond memories of your visit after this meeting is over.

September 2004

D. T. Lee

# Preface

This volume contains the proceedings of the 2nd Asian Symposium on Programming Languages and Systems (APLAS 2004). The symposium was held in Taipei, Taiwan and was sponsored by the Asian Association for Foundation of Software (AAFS) and the Academia Sinica.

Following our call for papers, 97 full submissions were received. Almost all the papers were reviewed by three (or more) program committee members with the help of external reviewers. The program committee met electronically over a 10-day period and accepted 26 papers after careful deliberations. I would like to thank members of the APLAS 2004 Program Committee, for the tremendous effort they put into their reviews and deliberations, and all the external reviewers for their invaluable contributions.

The final program covered both foundational and practical issues in programming languages and systems. Apart from the 26 accepted papers, the symposium also featured invited talks from three distinguished speakers, Joxan Jaffar (National University of Singapore), Frank Pfenning (Carnegie Mellon University, USA) and Martin Odersky (École Polytechnique Fédérale de Lausanne, Switzerland).

Many people helped to promote APLAS as a high-quality forum in Asia to serve programming language researchers worldwide. Following a series of well-attended workshops that were held in Singapore (2000), Daejeon (2001), and Shanghai (2002), the first formal symposium was successfully held in Beijing in 2003. The present symposium benefited from the past momentum, and was also due to the contributions of many people.

Foremost, I am grateful to the General Chair, D. T. Lee, for his invaluable support and guidance, making our symposium in Taipei possible. I am also indebted to our Local Arrangements Chair, Tyng-Ruey Chuang, for the considerable effort he put into planning and organizing the meeting itself. Hidehiko Masuhara kindly agreed to act as Poster Chair, and Shengchao Qin helped with publicity matters. From the AAFS Committee, I would like to especially thank Atsushi Ohori and Tetsuo Ida for providing sound advice. Last but not least, I thank Florin Craciun for his dedication in handling the CyberChair submissions system and other administrative matters.

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