

Editor-in-Chief

A. Joe Turner, Seneca, SC, USA

Editorial Board

Foundations of Computer Science

Mike Hinchey, Lero, Limerick, Ireland

Software: Theory and Practice

Michael Goedicke, University of Duisburg-Essen, Germany

Education

Arthur Tatnall, Victoria University, Melbourne, Australia

Information Technology Applications

Ronald Waxman, EDA Standards Consulting, Beachwood, OH, USA

Communication Systems

Guy Leduc, Université de Liège, Belgium

System Modeling and Optimization

Jacques Henry, Université de Bordeaux, France

Information Systems

Jan Pries-Heje, Roskilde University, Denmark

ICT and Society

Jackie Phahlamohlaka, CSIR, Pretoria, South Africa

Computer Systems Technology

Paolo Prinetto, Politecnico di Torino, Italy

Security and Privacy Protection in Information Processing Systems

Kai Rannenber, Goethe University Frankfurt, Germany

Artificial Intelligence

Tharam Dillon, Curtin University, Bentley, Australia

Human-Computer Interaction

Annelise Mark Pejtersen, Center of Cognitive Systems Engineering, Denmark

Entertainment Computing

Ryohei Nakatsu, National University of Singapore

IFIP – The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is about information processing may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

Arthur Tatnall Tilly Blyth Roger Johnson (Eds.)

Making the History of Computing Relevant

IFIP WG 9.7 International Conference, HC 2013
London, UK, June 17-18, 2013
Revised Selected Papers



Springer

Volume Editors

Arthur Tatnall
Victoria University
City Flinders Campus, PO Box 14428, Melbourne, VIC 8001, Australia
E-mail: arthur.tatnall@vu.edu.au

Tilly Blyth
Science Museum
Exhibition Road, South Kensington, London SW7 2DD, UK
E-mail: tilly.blyth@sciencemuseum.ac.uk

Roger Johnson
Computer Conservation Society
24 Comet Close, Ash Vale, Aldershot, Hampshire, GU12 5SG, UK
E-mail: r.johnson@bcs.org.uk

ISSN 1868-4238
ISBN 978-3-642-41649-1
DOI 10.1007/978-3-642-41650-7
Springer Heidelberg New York Dordrecht London

e-ISSN 1868-422X
e-ISBN 978-3-642-41650-7

CR Subject Classification (1998): K.2, K.3, K.8.0, H.5, I.3.7, K.4

© IFIP International Federation for Information Processing 2013

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

Why is a study of the history of computing important? Displaying and examining the remains of old mainframe and mini-computers is of considerable interest to those who were involved in building or using them, but for others, these displays or the descriptions of this technology are of little relevance and are difficult to engage with. Many people have a modest appreciation of how electronic digital computing has developed over the last 70 years, but they understand (or care) little about details of the configurations of these machines or how they differ from modern computers. How can we turn our histories into a form that people today can understand and appreciate?

The articles in this book have resulted from a conference – Making the History of Computing Relevant – held in the Science Museum, London, in June 2013. The conference costs were completely sponsored by Google. The aim of the conference was to discuss what needs to be done to make the history of computing relevant and interesting to the general public today: to discuss how we can display the *meaning* of computing and make it “real.” Would shifting the emphasis from the technology itself to how it was used make a difference? How about stories of the designers, builders, and users of these computers? Would the use of replicas, re-builds, or simulations make this history more interesting? What lessons does history tell us about the possible future of the digital revolution? The conference was organized by IFIP WG 9.7, Science Museum, British Computer Conservation Society, and Google.

The articles in this book were selected from those presented at the conference, and the authors were given an opportunity to improve them, before publication, based on conference feedback. All have been peer reviewed. The book contains several sections to provide some coherence to the articles:

- The Importance of Storytelling in Museums
- Spotlight on Some Key Collections and Their Future Plans
- Thoughts on Expanding the Audience for Computing History
- Spotlight on some Research Projects
- Integrating History with Computer Science Education
- Putting the History of Computing into Different Contexts
- Celebrating Nostalgia for Games – And Its Potential as Trojan Horse
- The Importance and Challenges of Working Installations
- Reconstruction Stories

The chapters cover a wide range of topics related to the history of computing, and offer a number of different approaches to making this history relevant. These

range from discussion of approaches to describing and analyzing the history through storytelling and education to description of various collections, working installations, and reconstruction projects.

June 2013

Arthur Tatnall
Tilly Blyth
Roger Johnson

Organization

Program Committee

Arthur Tatnall (Chair)	IFIP WG9.7, Australia
David Anderson	IFIP WG9.7, UK
Tilly Blyth	Science Museum, UK
Martin Campbell-Kelly	UK
John Impagliazzo	USA
Roger Johnson	CCS, UK
Lars Leide	IEEE Annals, Denmark
Jochen Viehoff	Heinz Nixdorf MuseumsForum, Germany
Lynette Webb	Google, UK

Local Organizing Committee

Tilly Blyth (Chair), Science Museum
Roger Johnson, CCS
Lynette Webb, Google
Selina Pang, Science Museum
Arthur Tatnall, IFIP WG9.7

Table of Contents

The Importance of Storytelling in Museums

Exhibiting the Online World: A Case Study	3
<i>Marc Weber</i>	

Narratives in the History of Computing: Constructing the <i>Information Age</i> Gallery at the Science Museum	25
<i>Tilly Blyth</i>	

Making History Relevant through the Provision of Education, Stories and Interactive Experiences	35
<i>Arthur Tatnall and Bill Davey</i>	

Spotlight on Some Key Collections and Their Future Plans

The Heinz Nixdorf Museums Forum, Central Venue for the “History of Computing”	47
<i>Norbert Ryska and Jochen Viehoff</i>	

The Computers’ Collection at the Polytechnic Museum	53
<i>Marina Smolevitskaya</i>	

Thoughts on Expanding the Audience for Computing History

Making History Relevant: The Case of Computing	67
<i>Gauthier van den Hove</i>	

“The Internet: A Belgian Story?” The Mundaneum: Creating a New Forum to Debate the Internet Issue in the French-Speaking Part of Belgium	79
<i>Delphine Jenart</i>	

Spotlight on Some Research Projects

The Konrad Zuse Internet Archive Project	89
<i>Julian Röder, Raúl Rojas, and Hai Nguyen</i>	

Discovery of Two Historical Computers in Switzerland: Zuse Machine M9 and Contraves Cora and Discovery of Unknown Documents on the Early History of Computing at the ETH Archives	96
<i>Herbert Bruderer</i>	

The Relevance of Computing Research History – The Monads-PC:
 A Case Study 105
A. Barbara Ainsworth, C. Avram, and J. Sheard

Integrating History with Computer Science Education

Using Old Computers for Teaching Computer Science 121
Giovanni A. Cignoni and Fabio Gadducci

Computing: Is There a Future in the Past? 132
Chris Monk

Bringing Relevance to Computing Courses through History 135
John Impagliazzo and Mohammed Samaka

Using Events from the Past to Inform the Future 144
Martha E. Crosby

The Impact of the Microprocessor 149
Anthony C. Davies

Putting the History of Computing into Different Contexts

The Voice in the Machine: Oral History and Making the Computer
 Relevant 163
Thomas Lean

Telling the Long and Beautiful (Hi)Story of Automation! 173
Marie d’Udekem-Gevers

Competing Histories of Technology: Recognizing the Vital Role
 of International Scientific Communities behind the Innovation
 of the Internet 196
Christopher Leslie

History of Computer Science as an Instrument of Enlightenment 207
Yakov Fet

Celebrating Nostalgia for Games – And Its Potential as Trojan Horse

The Popular Memory Archive: Collecting and Exhibiting Player
 Culture from the 1980s 215
Helen Stuckey, Melanie Swalwell, and Angela Ndalianis

The Introduction of Computer and Video Games in Museums – Experiences and Possibilities	226
<i>Tiia Naskali, Jaakko Suominen, and Petri Saarikoski</i>	

The Importance and Challenges of Working Installations

Computer Conservation Society (CCS) – Its Story and Experience	249
<i>Roger Johnson</i>	
Museums – What They Can and Should Be Doing	258
<i>Charles H. Lindsey</i>	
History, Nostalgia and Software	266
<i>David Holdsworth</i>	
The Teenage “Baby” on Show	274
<i>Christopher P. Burton</i>	

Reconstruction Stories

Reconstruction of Konrad Zuse’s Z3	287
<i>Horst Zuse</i>	
EDSAC Replica Project	297
<i>Andrew Herbert and David Hartley</i>	
The Harwell Dekatron Computer	309
<i>Kevin Murrell</i>	
Capturing, Restoring, and Presenting, the Independent Radar Investigation System (IRIS)	314
<i>Benjamin Trethowan</i>	
Author Index	321