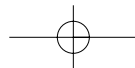
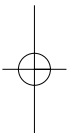
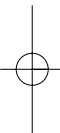
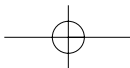
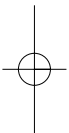
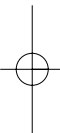
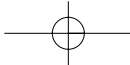


Atlas of Cyberspace





Atlas of Cyberspace

Martin Dodge and Rob Kitchin

Harlow, England ■ London ■ New York ■ Reading, Massachusetts ■ San Francisco ■
Toronto ■ Don Mills, Ontario ■ Sydney ■ Tokyo ■ Singapore ■ Hong Kong ■ Seoul ■
Taipei ■ Cape Town ■ Madrid ■ Mexico City ■ Amsterdam ■ Munich ■ Paris ■ Milan ■



ADDISON-WESLEY
an imprint of
Pearson Education

PEARSON EDUCATION LIMITED

Head Office:
Edinburgh Gate
Harlow CM20 2JE
Tel: +44 (0)1279 623623
Fax: +44 (0)1279 431059

London Office:
128 Long Acre
London WC2E 9AN
Tel: +44 (0)20 7447 2000
Fax: +44 (0)20 7240 5771
Website: www.it-minds.com

First published in Great Britain in 2001

© Pearson Education Ltd 2001

The rights of Martin Dodge and Rob Kitchin to be identified as authors of this work have been asserted by them in accordance with the Copyright, Designs and Patents Act 1988.

ISBN 0-201-74575-5

British Library Cataloguing in Publication Data

A CIP catalogue record for this book can be obtained from the British Library.

Library of Congress Cataloging in Publication Data

Applied for.

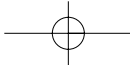
All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without either the prior written permission of the Publishers or a licence permitting restricted copying in the United Kingdom issued by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London W1P 0LP. This book may not be lent, resold, hired out or otherwise disposed of by way of trade in any form of binding or cover other than that in which it is published, without the prior consent of the Publishers.

Many of the designations used by manufacturers and sellers to distinguish their products are claimed as trademarks. Pearson Education Limited has made every attempt to supply trademark information about manufacturers and their products mentioned in this book.

10 9 8 7 6 5 4 3 2

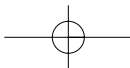
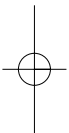
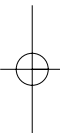
Designed by Sue Lamble
Typeset by Pantek Art Ltd, Maidstone, Kent
Printed and bound in Italy

The Publishers' policy is to use paper manufactured from sustainable forests.

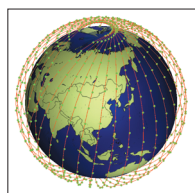


Martin dedicates this book to his Nan, with lots of love

Rob dedicates this book to Cora



Contents



1

Preface : ix

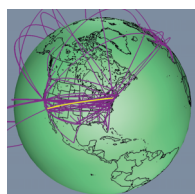
Acknowledgements : xi

Mapping cyberspace : 1

Issues to consider when viewing images : 3

Structure of the book : 7

Concluding comment : 8



2

Mapping infrastructure and traffic : 9

Historical maps of telecommunications : 12

Maps from the birth of the Net : 17

Mapping where the wires, fiber-optic cables and satellites really are : 20

Infrastructure census maps : 25

Domain name maps : 28

Marketing maps of Internet service providers : 30

Interactive mapping of networks : 33

Visualizing network topologies in abstract space : 38

The geography of data flows : 52

Mapping traceroutes : 62

What's the Net "weather" like today? : 67

Mapping cyberspace usage in temporal space : 70



3

Mapping the Web : 73

Information spaces of the Internet : 75

The beginning of the Web : 79

Mapping individual websites : 80

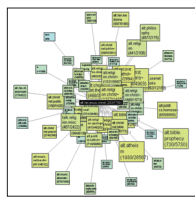
Mapping tools to manage websites : 90

Mapping website evolution : 102

Mapping paths and traffic through a website : 104

'The view from above': 2-D visualization and navigation of the Web : 114

'The view from within': 3-D visualization and navigation of the Web : 131



4

Mapping conversation and community : 153

Mapping email : 155

Mapping mailing lists and bulletin boards : 158

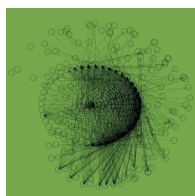
Mapping Usenet : 164

Mapping chat : 174

Mapping MUDs : 180

Mapping virtual worlds : 195

Mapping game space : 214



5

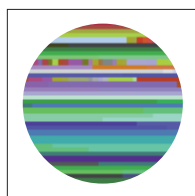
Imagining cyberspace : 227

Science fiction visions of cyberspace : 229

Cinematic visions of cyberspace : 234

Artistic imaginings: subversive surfing and warping the Web : 241

Imagining the architecture of cyberspace : 251

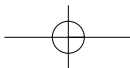
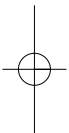
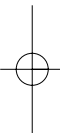
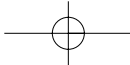


6

Final thoughts : 257

Further reading : 261

Index : 263



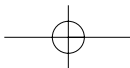
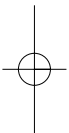
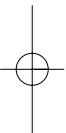
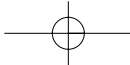
Preface

It is now over 30 years since the first Internet connection was made, between nodes installed at UCLA and Stanford University in the United States. Since then, a vast network of information and communications infrastructure has encircled the globe supporting a variety of cyberspace media – email, chat, the Web, and virtual worlds. Such has been the rapid growth of these new communications methods that by the end of 2000 there were over 400 million users connected to the Internet.

Accompanying this growth in the infrastructure, the numbers of users and the available media has been the formation of a new focus for cartography: mapping cyberspace. Maps have been created for all kinds of purposes, but the principal reasons are: to document where infrastructure is located; to market services; to manage Internet resources more effectively; to aid searching, browsing and navigating on the Web; and to explore potential new interfaces to different cyberspace media. In creating these maps, cartographers have used innovative techniques that open up new ways to understand the world around us.

This is the first book to draw together the wide range of maps produced over the last 30 years or so to provide a comprehensive atlas of cyberspace and the infrastructure that supports it. Over the next 300 or so pages, more than 100 different mapping projects are detailed, accompanied by full-colour example maps and an explanation as to how they were created.

Martin Dodge and Rob Kitchin
www-london.uk-maynooth.ie-cyberspace.net
December 2000



Acknowledgements

The *Atlas of Cyberspace* represents five years' worth of research, collating maps and research papers, and interviewing the maps' creators. In that time, many people have helped us. We are grateful to all those who assisted us in the writing and production of the *Atlas of Cyberspace*, particularly those who generously allowed us to feature maps and images of their work.

Special thanks are due to the following who went out of their way to help: Paul Adams, Keith Andrews, Richard Bartle, Mike Batty, Tim Bray, Peter Burden, Stuart Card, Chaomei Chen, Bill Cheswick, Ed Chi, K Claffy, Paul Cluskey, John Cugini, Judith Donath, Steve Eick, Gunilla Elam, Ben Fry, Joe Gurman, Muki Haklay, Nigel Hayward, Andy Hudson-Smith, Young Hyun, Jon Ippolito, Charles Lee Isbell Jr, Marty Lucas, Ernest Luk, Paul Kahn, Kate McPherson and family, Carl Malamud, Jessica Marantz, Fumio Matsumoto, Tamara Munzner, Bonnie Nardi, Marcos Novak, Linda Peake, Larry Press, Henry Ritson, Greg Roelofs, Warren Sack, Peter Salus, Gareth Smith, Marc Smith, Greg Staple, Paul Torrens, Roland Vilett, Martin Wattenberg, Darren Williams, Patrick Warfolk, Matt Zook, Mary Goodwin and Catherine Seigneret (The Cable & Wireless Archives, Porthcurno Cornwall, UK). We would also like to thank the team at Pearson – Michael Strang, Sally Carter and Katherin Ekstrom – for their enthusiastic support of this project.

Whilst every effort was made to contact copyright holders of the maps and images, we apologise for any inadvertent omissions. If any acknowledgement is missing, it would be appreciated if contact could be made (care of the publisher) so that this can be rectified in any future edition.

If you have any comments, questions or suggestions, we can be contacted at: authors@AtlasofCyberspace.com

Cover shows the Solar and Heliospheric Observatory (SOHO) Extreme ultraviolet Imaging Telescope (EIT) image. SOHO is a mission of international cooperation between ESA and NASA. <http://soho.nascom.nasa.gov/>

