

Gerard Chollet, Maria Gabriella Di Benedetto,
Anna Esposito and Maria Marinaro (Eds)

Speech Processing, Recognition and Artificial Neural Networks

Proceedings of the 3rd International School on Neural Nets
“Eduardo R. Caianiello”



Springer

Gerard Chollet, PhD
ENST-CNR URA 820, 46 rue Barrault, 75634 Paris Cedex 13, France

Maria Gabriella Di Benedetto, PhD
INFOCOM Department, Rome University "La Sapienza", via Eudossiana 18, I00184 Rome, Italy

Anna Esposito, PhD
IIASS, via G Pellegrino 19, I-84019 Vietri sul Mare (SA), Italy

Maria Marinaro, PhD
IIASS, via G Pellegrino 19, I-84019 Vietri sul Mare (SA), Italy

ISBN-13: 978-1-85233-094-1 Springer-Verlag London Berlin Heidelberg

British Library Cataloguing in Publication Data

Speech processing, recognition and artificial neural
networks : proceedings of the 3rd International School on
Neural Nets "Eduardo R. Caianiello"

1.Speech processing systems - Congresses 2.Speech
perception - Congresses 3.Neural networks (Computer
science) - Congresses

I.Chollet, Gerard II.International School on Neural Nets
(3rd : 1998 : Salerno, Italy)

006.4754

ISBN-13: 978-1-85233-094-1 e-ISBN-13: 978-1-4471-0845-0

DOI: 10.1007/978-1-4471-0845-0

Library of Congress Cataloging-in-Publication Data

A catalog record for this book is available from the Library of Congress

Apart from any fair dealing for the purposes of research or private study, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the publishers, or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency. Enquiries concerning reproduction outside those terms should be sent to the publishers.

© Springer-Verlag London Limited 1999

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

The publisher makes no representation, express or implied, with regard to the accuracy of the information contained in this book and cannot accept any legal responsibility or liability for any errors or omissions that may be made.

Typesetting: Camera ready by contributors

34/3830-543210

Contents

Section 1 - Fundamentals of Speech Analysis and Perceptron

Articulatory Constraints on Distinctive Features <i>John J. Ohala</i>	3
"Herr Müller vivrà a Taranto con i suoi colleghi austriaci" Investigations on a fragment of Italian Phonology <i>Andrea Calabrese</i>	21
Acoustic Analysis and Perception of Classes of Sounds (vowels and consonants) <i>Maria Gabriella Di Benedetto and Anna Esposito</i>	54
Speech and Voice Perception: Beyond Pattern Recognition <i>Jean-Sylvain Liénard</i>	85

Section 2 - Speech Processing

Analysis in Automatic Recognition of Speech <i>Hynek Hermansky</i>	115
Speech Production and Perception Models and their Applications to Synthesis, Recognition, and Coding <i>Abeer Alwan, S. Narayanan, B. Strope and A. Shen</i>	138

Section 3 - Stochastic Models for Speech

Statistical Methods for Automatic Speech Recognition <i>Renato de Mori</i>	165
Statistical Modelling: from Speech Recognition to Text Translation <i>Hermann Ney</i>	190
Continuous Speech Recognition with Neural Networks: An Application to Railway Timetables Enquires <i>Dario Albesano, Franco Mana and Roberto Gemello</i>	216

Multi-Level Multi-Decision Model for Automatic Speech Recognition and Understanding <i>Taras K. Vintsiuk</i>	221
Generative Models for Automatic Speech Recognition, Understanding and Synthesis <i>Taras K. Vintsiuk</i>	225
Speech Modelling Virtual Laboratory <i>Mykola Sazhok</i>	229

Section 4 - Auditory and Neural Network Models for Speech

Auditory Modeling and Neural Networks <i>Piero Cosi</i>	235
Neural Networks for Automatic Speech Recognition: a Review <i>Jean-Paul Haton</i>	259
Preprocessing and Classification of English Stops Nasals and Fricatives <i>Anna Esposito, Graziano Izzo and Maria Marinaro</i>	281
Self-Organizing Feature Maps for Arabic Phonemes <i>M.A. Al-Sulaiman, S.I. Ahson and M.I. Al-Kanhal</i>	289

Section 5 - Task-Oriented Applications of Automatic Speech Recognition and Synthesis

Towards Fully Automatic Speech Processing Techniques for Interactive Voice Servers <i>Gérard Chollet, Jan Cernocký, Guillaume Gravier, Jean Hennebert, Dijana Petrovska-Delacrétaz and François Yvon</i>	297
Multi-modal Speech Synthesis with Applications <i>Björn Granström</i>	327
Author Index	347