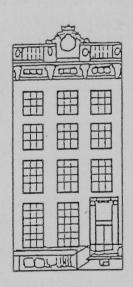
## PROCEEDINGS 15



# INSTITUTE OF PHONETIC SCIENCES UNIVERSITY OF AMSTERDAM 1991

## PROCEEDINGS

 $\mathbf{OF}$ 

THE INSTITUTE OF PHONETIC SCIENCES UNIVERSITY OF AMSTERDAM

15

AMSTERDAM 1991

ISSN: 0167-5613

© Copyright reserved 1991 Published by the Institute of Phonetic Sciences University of Amsterdam Herengracht 338 1016 CG Amsterdam

#### INTRODUCTION

This Proceedings 15 of the Institute of Phonetic Sciences of the University of Amsterdam contains seven papers concerning current research projects and three abstracts. The papers represent our two main research fields:

- PERCEPTUAL AND PHYSICAL DESCRIPTION OF VARIATION AND INVARIANCE IN SPEECH
- SPEECH COMMUNICATION: DEVELOPMENT AND PATHOLOGY

For your information a list of personnel is included, as well as a list of our publications in 1990 and 1991.

Furthermore, our "Institute's Profile" with up-to-date information about our institute and our research activities is available upon request.

All correspondence, including requests to be put on our mailing list, may be sent to:

Institute of Phonetic Sciences University of Amsterdam Herengracht 338 1016 CG Amsterdam The Netherlands

tel.: +31 20 5252183 fax: +31 20 5252197 telex 16526 NL UNASD

e-mail IFA@FON.LET.UVA.NL

December, 1991.

Editors:

F.J. Koopmans-van Beinum

A.F. Kloosterman

Technical realization: J. Bossema

J. Bossema F.W. Eelzak

D.T. Jaasma

#### LIST OF PERSONNEL

#### Scientific Staff

Prof. dr. ir. L.C.W. Pols

Drs. D.R. van Bergem

Dr. R.A.M.G. van Bezooijen

Drs. P.P.G. Boersma

Dr. L.F.M. ten Bosch

Drs. J.S.C. van Dijk

Drs. L.W.A. van Herpt

Ing. A.F. Kloosterman

Dr. F.J. Koopmans-van Beinum

Drs. C.T.L. Kuijpers

Drs. G.P.M. Laan

Drs. I.M. de Leeuw

Drs. E. te Lindert

Drs. G.L.Meinsma

Dr. E.A. den Os

Drs. R.J.J.H. van Son

Drs. J.M. van der Stelt

Drs. M.T.J. Tielen

Ing. J. Verhave

Ir. X.Wang

Drs. D.J.M. Weenink

Drs. A. van Wieringen

director of the Institute

on AIO1 contract

on SPIN-ASSP2 contract until 1-7-'91

on AIO1 contract

on NWO3 contract since 1-11-'91

on AIO1 contract

on AIO1 contract

on AIO<sup>1</sup> contract

guest researcher (SPIN-ASSP2)

guest researcher

(on NWO<sup>3</sup> contract until 16-4-'91)

guest researcher (ESPRIT4)

on AIO1 contract until 1-5-'91

on ESPRIT4 contract

on AIO1 contract since 1-12-'91

on AIO1 contract

#### Technical and Administrative Staff

J. Bossema

F.W. Eelzak

D.T. Jaasma

A.W. van Maanen

A.G. Wempe

Facultary position as post-graduate student

<sup>2</sup> Dutch Speech Program for Promoting Information Technology Research

Netherlands Organization for Scientific Research

European Strategic Program for Research and Development of Information Technology

### **CONTENTS**

Aspects of neural nets David Weenink	page 1
Evaluating the performance of speech technology systems Louis C.W. Pols	27
The influence of speaking rate on vowel formant track shape as modelled by Legendre polynomials Rob J.J.H. van Son and Louis C.W. Pols	43
On relations between phone models, segment duration, and the Padé-expansion Louis F.M. ten Bosch	61
Synthesis of speech sounds from a multi-mass model of the lungs, vocal tract, and glottis Paul Boersma	79
Perceptual evaluation of voice quality before and after radiotherapy of patients with early glottic cancer and of normal speakers  Irma M. de Leeuw	109
The IBM speechviewer Ton G. Wempe and Marlien van Lunen	121
Abstracts  On the structure of vowel systems, aspects of an extended vowel model using effort and contrast, Louis F.M. ten Bosch  The role of focus words in natural and in synthetic continuous speech: acoustic aspects, Florien J. Koopmans-van Beinum  Temporal aspects of the voiced-voiceless distinction in speech development of young Dutch children, Cecile T.L. Kuijpers	131
List of publications in 1990 and 1991	137