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**ON**  
**ACOUSTICS, SPEECH AND**  
**SIGNAL PROCESSING**

**Volume 1**



# **ICASSP 82**

## **PROCEEDINGS**

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## **Volume 1 of 3**

**IEEE INTERNATIONAL CONFERENCE  
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# ICASSP 82

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Moreover, the following institutions have offered a contribution to the success of the conference.

CNET: Centre National d'Etudes des Télécommunications

CNRS: Centre National de la Recherche Scientifique

DRET: Direction des Recherches Etudes et Techniques (French Ministry of Defense)

ENST: Ecole Nationale Supérieure des Télécommunications

ERO: European Research Office (US Army)

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- S2.2** A new pitch measurement algorithm for speech  
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- DSP3.2** Estimation of the autoregressive parameters from observations of a noise corrupted autoregressive time series  
Gringas D.F., Naval Ocean Systems Center, Code 7134, San Diego, CA 92152 U.S.A.
- DSP4.4** Digital lattice filter design using frequency domain modeling approach  
Lim Y.C., Parker S.R., Electrical Engineering Department, Naval Postgraduate School, Monterey, CA 93940, U.S.A.
- UWA2.2** Acoustic classification of submerged targets  
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- UWA3.2** Threshold effects in time-delay estimation using narrow band signals  
Ianniello J.P., Naval Underwater Systems Center, New-London, CT 06320, U.S.A.

### Volume 2

- UWA4.3** Dominant mode power spectrum estimation  
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- P3.10** An algorithm for connected word recognition  
Bridle J.S., Chamberlain R.M., Brown M.D., Joint Speech Research Unit, Princess Elisabeth Way, Cheltenham GL52 5AJ, U.K.
- P3.12** Discrete utterance speech recognition

### without time normalization

- Shore J.E., Burton D., Naval Research Laboratory, Washington, DC 20379, U.S.A.
- UWA5.4** Direct coherence estimation via a constrained least-squares linear-predictive fast algorithm  
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- IM4.6** Efficient MVE image reconstruction for arbitrary measurement geometries  
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- S10.9** Locally constrained dynamic programming in automatic speech recognition  
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### Volume 3

- DSP11.6** A digital adaptive noise canceller based on a stabilized version of the Widrow L.S.M. algorithm  
Mc Whirter J.G., Palmer K.S., Roberts J.B.G., The Royal Signals and Radar Establishment, Malvern, Worcs WR14 3PS, U.K.
- UWA6.5** Quantization degradation in superdirective processing of underwater acoustic arrays  
Walker R.S., Dean K.L., Defense Research Establishment, Atlantic, P.O., Box 1012, Dartmouth, Nova Scotia B2Y 3Z7, Canada
- UWA6.9** Fitting polynomials to data in the presence of noise  
Owsley N.L., New London Laboratory, Naval Underwater Systems Center, New London, CT, 06320, U.S.A.

## ICASSP 82 TECHNICAL PROGRAM SCHEDULE

| TIMING                                                                        |         | DIGITAL SIGNAL PROCESSING                                                        | DIGITAL SIGNAL PROCESSING                             | AUDIO AND DSP APPLICATIONS                                                          | UNDERWATER ACOUSTICS AND DSP APPLICATIONS      | IMAGE PROCESSING                                                    | SPEECH IMAGE SYSTEMS                                      | SPEECH SYNTHESIS AND RECOGNITION                                      | SPEECH CODING AND ANALYSIS                                     |
|-------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------|
|                                                                               |         | Room : 30                                                                        | Room : 32 a                                           | Room : 32 b                                                                         | Room : 34                                      | Room : 31                                                           | Room : 33 a                                               | Room : 33 b                                                           | Room : 35                                                      |
| MONDAY, MAY 3                                                                 | 9 h 00  | <b>SALLE BLEUE</b> Opening Address                                               |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
|                                                                               | 9 h 15  | <b>SALLE BLEUE</b> Plenary Session :                                             |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
|                                                                               | 10 h 30 | <b>SALLE BLEUE</b> Impact of Digital Signal Processing on our Society            |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
|                                                                               | 11 h 00 | <b>DSP1</b><br>Fourier and Polynomial Transforms                                 | <b>DSP2</b><br>Quantization Effects                   | <b>AU1</b><br>Digital Audio                                                         | <b>UWA1</b><br>Medium Effects                  | <b>IM1</b><br>Multidimensional Spectral Analysis                    | <b>S1</b><br>Speech Enhancement and Noise Reduction       | <b>S2</b><br>Pitch Detection                                          | <b>S3</b><br>Medium Band Coding I                              |
|                                                                               | 12 h 30 |                                                                                  |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
|                                                                               | 14 h 30 | <b>DSP3</b><br>Rational Model Identification                                     | <b>DSP4</b><br>Filter Design I                        | <b>UWA2</b><br>Signal Processing Applications and Radar                             | <b>UWA3</b><br>Time Delay Estimation           | <b>IM2</b><br>Image Coding                                          | <b>Poster 1</b><br>DSP and Speech Systems Implementations | <b>S4</b><br>Discrete Utterance Recognition                           | <b>S5</b><br>Narrow Band Coding                                |
|                                                                               | 18 h 00 |                                                                                  |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
| EVENING                                                                       |         | MEETINGS TO BE ANNOUNCED IN THE FINAL PROGRAM                                    |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
| EXHIBITS : 10 h 30 - 18 h 00                                                  |         |                                                                                  |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
| TUESDAY, MAY 4                                                                | 9 h 00  | <b>DSP5</b><br>Adaptive Filtering                                                | <b>DSP6</b><br>Hardware and Software                  | <b>Poster 2</b><br>Biomedical Signals and Aids for the Handicapped                  | <b>UWA4</b><br>Array Processing I              | <b>IM3</b><br>Image Analysis I                                      | <b>Poster 3</b><br>Speech Recognition Systems             | <b>S6/7</b><br>Vocal Tract and Cord Models<br>Speech Synthesis        | <b>S8/9</b><br>32 kbit/s Coding<br>Subjective Quality of Codes |
|                                                                               | 12 h 30 |                                                                                  |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
|                                                                               | 14 h 30 | <b>DSP7</b><br>Spectrum Analysis I                                               | <b>DSP8</b><br>VLSI for Digital Signal Processing     |                                                                                     | <b>UWA5</b><br>Detection Estimation            | <b>IM4/5</b><br>Statistical Image Processing<br>Image Understanding | <b>Poster 4</b><br>Image Coding and Hardware              | <b>S10</b><br>Dynamic Time Warping                                    | <b>S11</b><br>Speech Analysis                                  |
|                                                                               | 18 h 00 |                                                                                  |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
| EVENING                                                                       |         | AWARDS BANQUET (20 h 00)                                                         |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
| EXHIBITS : 9 h 00 - 18 h 00                                                   |         |                                                                                  |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
| WEDNESDAY, MAY 5                                                              | 9 h 00  | <b>DSP9/10</b><br>Non stationary Modeling and Processing<br>Spectrum Analysis II | <b>DSP 11/12</b><br>Equalization<br>Echo Cancellation | <b>AU2</b><br>Audio and Electro Acoustics                                           | <b>UWA6</b><br>Array Processing II             | <b>IM6</b><br>Image Restoration and Reconstruction                  | <b>Poster 5</b><br>Speech Analysis and Synthesis Systems  | <b>S12/13</b><br>Connected Speech Recognition<br>Speaker Recognition  | <b>S14</b><br>Medium Band Coding II                            |
|                                                                               | 12 h 30 |                                                                                  |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
|                                                                               | 14 h 30 | <b>DSP13</b><br>Linear Models and Fast Algorithms                                | <b>DSP14</b><br>DSP in Communication Networks         | <b>DSP15/16</b><br>Filter Design II<br>Signal Recons-<br>truction and Deconvolution | <b>UWA7</b><br>Signal Processing in Geophysics | <b>IM7</b><br>Image Analysis II                                     | <b>Poster 6</b><br>Speech Coding Systems                  | <b>S15/16</b><br>Acoustic Front Ends<br>Speech Recognizers Evaluation | <b>IM8</b><br>Multidimensional Filtering                       |
|                                                                               | 18 h 00 |                                                                                  |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
| EVENING                                                                       |         | MEETINGS TO BE ANNOUNCED IN THE FINAL PROGRAM                                    |                                                       |                                                                                     |                                                |                                                                     |                                                           |                                                                       |                                                                |
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| Deprettere, E.F.A.    | 17121                 | Gambotto, J.P.        | 1920                       |
| Dereffye, J.          | 367                   | Garcia Gomez, R.      | 1585                       |
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| Derutin, J.P.         | 1924                  | Garibotto, G.         | 2059                       |
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L.J. Libois, *President of the France Section of IEEE, 48, rue de la Procession, 75724 Paris, France.*

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**PLACE :** SALLE BLEUE

### SESSION PLENARY : IMPACT OF DIGITAL SIGNAL PROCESSING ON OUR SOCIETY

**TIME :** 9 h. 15 - 10 h. 30, Monday, May 3, 1982  
**PLACE :** SALLE BLEUE  
**CHAIRMAN :** Maurice Bellanger, *Télécommunications Radioélectriques et Téléphoniques, 5, av. Réaumur, 92350 Plessis-Robinson, France.*

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## MONDAY MORNING DIGITAL SIGNAL PROCESSING

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**TIME :** 11 h. 00 - 12 h. 30, Monday May 3, 1982  
**PLACE :** SALLE 30  
**CHAIRMAN :** Henri Nussbaumer, EPFL, Département d'Electricité, 16, chemin de Bellerive, CH-1007 Lausanne, Switzerland

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 May 3, 1982  
**PLACE :** SALLE 32 b  
**CHAIRMAN :** L. Eggermont, Philips BLDVOI,  
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 May 3, 1982  
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**CHAIRMAN :** B. Lunde, Saclant Centre, Viale  
 San Bartholomeo, La Spezia,  
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**TIME :** 11 h. 00 - 12 h. 30, Monday  
May 3, 1982  
**PLACE :** SALLE 31  
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## MONDAY MORNING SPEECH SYSTEMS

### SESSION S1 : SPEECH ENHANCEMENT AND NOISE REDUCTION

**TIME :** 11 h. 00 - 12 h. 30, Monday  
May 3, 1982  
**PLACE :** SALLE 33 a  
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## MONDAY MORNING SPEECH SYNTHESIS AND RECOGNITION

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**TIME :** 11 h. 00 - 12 h. 30, Monday  
May 3, 1982  
**PLACE :** SALLE 33 b  
**CHAIRMAN :** W.J. Hess, Institut für Datenverarbeitung, Arcisstrasse 21, 8000 München, F.R.G.

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## MONDAY MORNING SPEECH CODING

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**TIME :** 11 h. 00 - 12 h. 30, Monday  
 May 3, 1982  
**PLACE :** SALLE 35  
**CHAIRMAN :** D. Esteban, E77/B60, IBM Laboratory, Research Triangle Park, NC 27609, U.S.A.

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## MONDAY AFTERNOON DIGITAL SIGNAL PROCESSING

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**SESSION DSP3 :** RATIONAL MODEL IDENTIFICATION  
**TIME :** 14 h. 30 - 18 h. 00, Monday  
 May 3, 1982  
**PLACE :** SALLE 30  
**CHAIRMAN :** E.N. Protonotarios, Technical University, 42, October 28th Street, Athens 147, Greece.

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