

Maria Palmese

PERSONAL DATA

Maria Palmese

Born on February 12th, 1976, in Genova, Italy

Address: Via Assarotti 39/12, 16122 Genova, Italy

Phone +39-010-877950, Mobile phone +39-3284731201, E-mail: palmese@dibe.unige.it

Marital status: single

CURRENT POSITION

February 2005 - present

Post-doc research associate in the Department of Biophysical and Electronic Engineering (DIBE), University of Genoa.

Research topic: 'Processing of underwater acoustic signals in new-generation sonar systems.'

EDUCATION

February 2002 – January 2005

Ph.D. Course in Electronic Engineering and Computer Science in the Department of Biophysical and Electronic Engineering (DIBE), University of Genoa.

Title of the dissertation: 'Underwater Acoustic Imaging: Signal Simulation, Real-Time Beamforming, 3-D Image Analysis.'

Tutor: Prof. Ing. Andrea Trucco.

May 2001

Engineer qualification granted by the Engineers Association of Genoa, May 2001.

Grade: 201/240.

October 1994 – March 2001

"Laurea" (M.S.) degree in Electronic Engineering with full marks and "summa cum laude" from the University of Genoa in March 2001.

Title of thesis work: "Development and integration of methods to generate and process seafloor sonar images."

Supervisor: Prof. Ing. Andrea Trucco.

Cosupervisor: Dr. Alessandro Pescetto.

July 1994

General Certificate of Education from the "Liceo Scientifico L. Da Vinci" of Genoa (five years of high-school studies).

Grade: 60/60.

PROFESSIONAL EXPERIENCE

June 2001 – July 2004

Scientific collaborations with:

- Department of Biophysical and Electronic Engineering (DIBE), University of Genoa;
- Interuniversity Center of Integrated Systems for Marine Environment (ISME), University of Genoa;
- Department of Computer Science, University of Verona.

Topics: array signal processing; sonar systems and underwater signal processing for 3-D imaging; acoustic image analysis and classification.

RESEARCH EXPERIENCE AND PROJECT ACTIVITY

In the last few years, my research activity has been concentrated on the study and development of signal processing methods for underwater acoustics applications. Attention has been focused on the design of sonar systems, especially three-dimensional ones, in particular, on:

- simulation of sonar signals;
- synthesis of optimized planar arrays;
- development of efficient 3-D beamforming algorithms;
- time-frequency analysis of acoustic signals;
- study of dereverberation techniques;
- study of 3-D acoustic image techniques aimed at obtaining a synthetic representation of an observed scene, useful for augmented reality and virtual reality applications.

I have carried out the above research activities partially within the context of the following projects, acting also as coordinator of the research work.

Projects:

2002-2005

SITAR – Seafloor Imaging and Toxicity: Assessment of Risks Caused by Buried Waste, European Commission, V FP, Environment Programme.

2001-2002

Development of a system for acoustic imaging in the air and for the location of walls to be applied to the automatic guidance of blind people, CNR Programma Agenzia 2000.

2001

Development and supply of software tools for the analysis of acoustic data, ENEA, Ente per le nuove tecnologie, l'energia e l'ambiente.

TEACHING ACTIVITY

2001-2005

Cosupervisor of final-year students for the “laurea” (M.S.) degree in Telecommunications, Electronic and Computer Science Engineering.

2002-2005

Assistance and support activity for 'Electrical Communications 1', a course attended by students for the "laurea" degree in Computer Science Engineering at the University of Genoa.

EDITORIAL SERVICE

Reviewer for the *IEEE Journal of Oceanic Engineering*

LANGUAGES

Italian (native language)

English (fluently spoken and written)

GENERAL COMPUTER SKILLS

Operating systems: Windows, Unix, Linux.

Programming: C, C++, Pascal, Matlab.

Software graphics tools.

AWARDS

Winner of the second prize of the Student Poster Competition organized by the International Conference MTS/IEEE Oceans 2005, Washington, D.C.

Winner of the third prize of the Student Poster Competition organized by the International Conference MTS/IEEE/TECHNO-OCEAN 2004, Kobe, Japan.

Finalist for the Student Poster Competition organized by the International Conference MTS/IEEE Oceans 2002, Biloxi, Mississippi, USA.

SCIENTIFIC PUBLICATIONS

International Journals:

[P1] M. Palmese, A. Bozzo, S. Jesus, J. Onofre, P. Picco, and A. Trucco, "Observation of Acoustical Signal Fluctuations by Time-Frequency Analysis Methods," *Acta Acustica United With Acustica*, vol. 88, No. 5, pp. 653-657, September/October 2002.

[P2] A. Trucco, M. Palmese, and S. Repetto, "Mosaicking Data in Seafloor Front-Scan Imaging," *Acta Acustica United With Acustica*, vol. 88, No. 5, pp. 767-770, September/October 2002.

[P3] A. Trucco, M. Palmese, and S. Repetto, "Image Projection and Composition With a Front-Scan Sonar System: Methods and Experimental Results," *IEEE Journal of Oceanic Engineering*, vol. 28, No. 4, pp. 687-698, October 2003.

- [P4] A. Caiti, M. Palmese, and A. Trucco, "Risk Assessment of Seafloor Waste: Acoustical Imaging of Buried Dumpings," *Journal of Computational Acoustics*, vol. 13, No. 2, pp. 385-401, June 2005.
- [P5] A. Caiti, R. Minciardi, V. Murino, M. Palmese, M. Robba, R. Sacile, and A. Trucco, "The SITAR Project: Development of Enabling Technologies for Risk Assessment of Toxic Waste Buried in the Seafloor Sediments", *Chemistry and Ecology, International Journal of Taylor & Francis Publishing Group*, **ACCEPTED**.
- [P6] M. Palmese and A. Trucco, "Acoustic Imaging of Underwater Embedded Objects: Signal Simulation for 3-D Sonar Instrumentation," *IEEE Transactions on Instrumentation and Measurement*, **SUBMITTED**.

Theses:

- [P7] "Laurea" Degree Thesis: Maria Palmese and Stefania Repetto, "Sviluppo e integrazione di metodi per la proiezione, la mosaicatura e l'elaborazione di immagini SONAR del fondale marino," March 2001.
Supervisor: Prof. Ing. Andrea Trucco.
Cosupervisor: Dr. Alessandro Pescetto.
- [P8] Ph.D. Thesis: Maria Palmese, "Underwater Acoustic Imaging: Signal Simulation, Real-Time Beamforming, 3-D Image Analysis," April 2005.
Tutor: Prof. Ing. Andrea Trucco.

Book Chapters:

- [P9] A. Trucco, M. Palmese, A. Fusiello, and V. Murino, "Three-Dimensional Underwater Acoustical Imaging and Processing," in *Underwater Acoustic Digital Signal Processing and Communication Systems*, R.S.H. Istepanian and M. Stojanovic, Eds. Boston: Kluwer Academic Publishers, pp. 247-274, 2002.

Conference Proceedings:

- [P10] M. Palmese, A. Bozzo, S. Jesus, J. Onofre, P. Picco, and A. Trucco, "Observation of Acoustical Signal Fluctuations by Time-Frequency Analysis Methods," *Sixth European Conference on Underwater Acoustics*, Gdansk, Poland, pp. 755-760, June 2002.
- [P11] A. Trucco, M. Palmese, and S. Repetto, "On Ray-Tracing and Interpolation in Seafloor Front-Scan Imaging," *Sixth European Conference on Underwater Acoustics*, Gdansk, Poland, pp. 535-540, June 2002.
- [P12] S. Repetto, M. Palmese, and A. Trucco, "Projection and Mosaicking of Real Data Gathered with a Front-Scan Sonar System," *MTS/IEEE Oceans 2002*, Biloxi, Mississippi, USA, pp. 2466-2471, October 2002.
- [P13] A. Caiti, V. Murino, M. Palmese, and A. Trucco "Object Reconstruction and Feature Extraction from 3-D Underwater Acoustic Scattering Measurements", *Tenth International Congress on Sound and Vibration*, Stockholm, Sweden, pp. 2449-2456, July 2003.

- [P14] P. Picco, A. Trucco, M. Palmese, and R. Meloni, "Sound Speed Variability and Oceanographic Processes in the Ross Sea (Antarctica)," *CD-ROM Proceedings of the Seventh European Conference on Underwater Acoustics*, Delft, The Netherlands, Paper no. 235, July 2004.
- [P15] M. Palmese, A. Caiti, V. Murino, and A. Trucco, "A Volume Growing Approach to Analyse Buried Objects in 3-D Acoustic Images," *Seventh European Conference on Underwater Acoustics*, Delft, The Netherlands, pp. 819-826, July 2004.
- [P16] M. Palmese and A. Trucco, "A Flexible Method to Simulate 3-D Underwater Sub-Bottom Images," *MTS/IEEE/Techno-Oceans 2004*, Kobe, Japan, pp. 2346-2353, November 2004.
- [P17] M. Palmese, A. Caiti, and A. Trucco, "On The Analysis Of Buried Objects By Processing 3-D Acoustic Images," *Oceans'05 Europe IEEE*, Brest, France, 6 pages, June 2005.
- [P18] S. Repetto, M. Palmese, and A. Trucco, "High-Resolution 3-D Imaging by a Sparse Array: Array Optimization and Image Simulation," *Oceans'05 Europe IEEE*, Brest, France, 6 pages, June 2005.
- [P19] M. Palmese and A. Trucco, "A Simulation Method for the Design of a 3-D Acoustical Imaging System for Sub-Bottom Investigation," *2005 IEEE Instrumentation and Measurement Technology Conference*, Ottawa, Canada, pp. 1240-1245, May 2005.
- [P20] M. Palmese and A. Trucco, "Analysis of Buried Objects in 3D Underwater Acoustic Images by a Volumetric Segmentation Algorithm," *MTS/IEEE Oceans'05*, Washington, D.C., September 2005.

Genoa, december 2005