



(IN ITALIANO)

## SEBASTIANO SERPICO

**Qualifica:** Professore Ordinario

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### Ambiti di insegnamento e ricerca

Gli insegnamenti tenuti negli scorsi anni rientrano nel settore delle telecomunicazioni, dell'elaborazione e del riconoscimento di immagini, del telerilevamento.

In riferimento alla ricerca, l'ambito principale riguarda l'analisi di immagini telerilevate per la generazione di mappe del territorio con tematismi quali: tipologie di coperture ed uso del suolo, valori stimati di parametri bio- e geo-fisici, cambiamenti intervenuti al suolo tra acquisizioni multitemporali. Le principali applicazioni riguardano il supporto alla protezione civile in relazione ai disastri naturali, i servizi relativi alle fonti rinnovabili di energia, il monitoraggio ambientale. Un ulteriore ambito di ricerca riguarda l'analisi di immagini biomediche.

### Orario di ricevimento

Martedì 16-17 e venerdì 11-12

Considerati i gli impegni istituzionali e di ricerca, si raccomanda di verificare preventivamente la disponibilità del docente nell'orario indicato; in caso negativo verrà proposto un orario alternativo.

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### Curriculum

Nato nel 1957 e residente a Genova, si è laureato in Ingegneria Elettronica nel 1982 ed ha conseguito il titolo di Dottore di ricerca in Comunicazioni elettriche nel 1989. E' attualmente titolare dei corsi: *Segnali e sistemi per le telecomunicazioni* e *Signal and Image Processing and Recognition*. L'ambito principale in cui si sviluppa la sua attività di ricerca riguarda l'analisi di immagini telerilevate per la generazione di mappe del territorio con tematismi quali: tipologie di coperture ed uso del suolo, valori stimati di parametri bio- e geo-fisici, cambiamenti intervenuti al suolo tra acquisizioni multitemporali. Le principali applicazioni riguardano il supporto alla protezione civile in relazione ai disastri naturali, i servizi relativi alle fonti rinnovabili di energia, il monitoraggio ambientale. Un ulteriore ambito di ricerca riguarda l'analisi di immagini biomediche.

Ha coordinato numerosi progetti di ricerca nazionali ed europei ed è stato responsabile scientifico dell'Unità di ricerca dell'Università di Genova in numerosi altri. E' autore o coautore di oltre 200 pubblicazioni scientifiche, di cui circa 60 in riviste internazionali. Dal 2001 è membro del comitato editoriale della rivista *IEEE Transactions on Geoscience and Remote Sensing*. Ha presieduto diversi congressi internazionali ed ha curato alcuni numeri speciali delle riviste *IEEE Transactions on Geoscience and Remote Sensing* e *Proceedings of the IEEE*. Ha ricevuto il Best Paper Award dell'*IEEE Workshop on Hyperspectral Image and Signal Processing* (2010).

Gli insegnamenti tenuti negli scorsi anni rientrano nel settore delle telecomunicazioni, dell'elaborazione e del riconoscimento di immagini, del telerilevamento.

E' membro del *Gruppo Telecomunicazioni e Tecnologie dell'Informazione* e, a livello internazionale, dell'*IEEE Geoscience and Remote Sensing Society*.

E' stato revisore di numerosi progetti di ricerca per la Comunità Europea e per altri enti nazionali ed esteri.

E' membro del Collegio dei docenti del Dottorato di Ricerca in *Scienze e Tecnologie per l'Ingegneria Elettronica e delle Telecomunicazioni*.

E' Presidente dell'*Istituto Superiore di Studi in Tecnologie dell'informazione e della Comunicazione* (ISICT).

E' Fellow dell'IEEE.

### Progetti di ricerca

- *ENDORSE – Energy downstream services – Providing energy components for GMES (funded by EU, FP7-SPACE, 2010-2013)*
- *SEAGOSS – Sistema informativo e di allertamento-gestione degli inquinamenti da oil slick e sedimenti (funded by Liguria Region, POR-FESR, 2012-2013)*
- *RIMA – Sviluppo di tecnologie e software per una rete Integrata previsionale mediterranea per la gestione dell'Ambiente marino e costiero (funded by the Ligurian District of Marine Technologies, FAR-MIUR, 2012-2015).*
- *OPERA – Civil protection from floods (funded by the Italian Space Agency, ASI; 2007-2010)*
- *ASI #2181 – Development and validation of multitemporal image analysis methodologies for multirisk monitoring of critical structures and infrastructures (ASI, 2009-2011)*
- *PROSCENIO – Program for the innovation of the technologies related to operational procedures, observation, and computation tools, validation criteria, and occurrence-probability estimation for hydrogeological, hydraulic, and fire risks (funded by the Italian Department for Civil Protection, 2005-2008)*
- *Survey and evaluation on ecological environment in selected areas of central China (funded by the Italian Ministry for Environment and Territory and by the Chinese Environmental Protection Agency; 2003-2005)*
- *SARIS – Preliminary project for a SAR image processing system (ASI, 2004)*
- *PRIN-2005 – Development and validation of innovative data-fusion techniques for environmental remote sensing (funded by the Italian Ministry of Education, University, and Research, MIUR, 2006-2007)*



### Pubblicazioni significative

#### ARTICOLI PUBBLICATI IN RIVISTE INTERNAZIONALI DAL 2008 AL 2013

1. G. Mercier, G. Moser, S. B. Serpico, "Conditional copula for change detection on heterogeneous SAR data," **IEEE Transactions on Geoscience and Remote Sensing**, Vol. 46, No. 5, May 2008, pp. 1428-1441.
2. G. Moser, S.B. Serpico, "Automatic parameter optimization for support vector regression for land and sea surface temperature estimation from remote-sensing data", **IEEE Trans. Geosci. Remote Sensing**, Vol. 47, March 2009, pp. 909-921.
3. G. Moser, S.B. Serpico, "Unsupervised change detection from multichannel SAR data by Markovian data fusion," **IEEE Transactions on Geoscience and Remote Sensing**, Vol. 47, July 2009, pp. 2114 – 2128.
4. G. Moser, S.B. Serpico, "Modeling the error statistics in support vector regression of surface temperature from infrared data", **IEEE Geosci. Remote Sensing Letters**, Vol. 6, July 2009, pp. 448-452.
5. V.A. Krylov, G. Moser, S.B. Serpico, J. Zerubia, "Enhanced dictionary-based SAR amplitude distribution estimation and its validation with very high-resolution data", **IEEE Geoscience and Remote Sensing Letters**, vol. 8, n 1, January 2011, pp. 148-152.
6. V.A. Krylov, G. Moser, S. B. Serpico, J. Zerubia, "Supervised high resolution dual polarization SAR image classification by finite mixtures and copulas", **IEEE J. Selected Topics in Signal Process**, vol. 5, June 2011, pp.554-566.
7. G. Moser, E. Angiati, S.B. Serpico, "Multiscale unsupervised change detection on optical images by Markov random fields and wavelets", **IEEE Geosci. Remote Sensing Letters**, vol. 8, no. 4, July 2011, pp.725-729.
8. G. Troglia, J. Le Moigne, J.A. Benediktsson, G. Moser, S.B. Serpico, "Automatic Extraction of Ellipsoidal Features for Planetary Image Registration", **IEEE Geosci. Remote Sensing Letters**, vol. 9, no. 1, January 2012, pp. 95-99.
9. S.B. Serpico, S. Dellepiane, G. Boni, G. Moser, E. Angiati, R. Rudari, Information Extraction From Remote Sensing Images for Flood Monitoring and Damage Evaluation, **Proceedings of the IEEE**, Vol. 100, no. 10, Oct. 2012 , pp. 2946 - 2970.
10. K.-S. Chen, S.B. Serpico, J.A. Smith, Remote Sensing of Natural Disasters - Scanning the Issue, **Proceedings of the IEEE**, Vol. 100 , no.10, Oct. 2012, pp. 2794 - 2797.
11. A. Voisin, V.A. Krylov, G. Moser, S.B. Serpico, J. Zerubia, "Classification of Very High Resolution SAR Images of Urban Areas Using Copulas and Texture in a Hierarchical Markov Random Field Model", **IEEE Geoscience and Remote Sensing Letters**, vol. 10, no. 1, January 2013, pp. 96-100.
12. G. Moser, S.B. Serpico, J.A. Benediktsson, "Land-Cover Mapping by Markov Modeling of Spatial-Contextual Information in Very-High-Resolution Remote Sensing Images", **Proceedings of the IEEE**, vol. 101, no. 3, March 2013, pp. 631-651.
13. V. Akbari, A.P. Doulgeris, G. Moser, T. Eltoft, S.N. Anfinsen, S.B. Serpico, "A Textural-Contextual Model for Unsupervised Segmentation of Multipolarization Synthetic Aperture Radar Images, **IEEE Transactions on Geoscience and Remote Sensing**, September, vol. 51, no. 4, April 2013, pp.2442 - 2453.
14. G. Moser, S.B. Serpico, "Combining Support Vector Machines and Markov Random Fields in an Integrated Framework for Contextual Image Classification", **IEEE Transactions on Geoscience and Remote Sensing**, vol. 51 , no. 5, part: 1, May 2013, pp. 2734 - 2752.
15. Vladimir A. Krylov, Gabriele Moser, Sebastiano B. Serpico, and Josiane Zerubia, On the Method of Logarithmic Cumulants for Parametric Probability Density Function Estimation, **IEEE Transactions on Image Processing**, in press, 2013 (disponibile in **IEEE Xplorer**, v. <http://ieeexplore.ieee.org>).



## NAME AND SURNAME

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## Teaching and research activities

The courses he has been teaching during the last years belong to the telecommunications, the digital image processing and recognition, and the remote sensing fields.

With reference to the research, his main field of interest is in remote sensing image analysis for territory map generation, with thematic information such as: ground cover and use typologies, bio- and geo-physical parameter estimated values, ground changes occurred during multitemporal acquisitions. The most important applications refer to the civil protection support in connection with natural disasters, services concerned with renewable energy sources, environmental monitoring. A further research field is biomedical images analysis.

## Contact

Tuesday 16-17.00 and Friday 11-12.00.

Considered the institutional and research commitments, it is recommended to verify in advance the professor availability during the above mentioned time; in the negative case an alternative time schedule will be proposed.

## Curriculum

Born in 1957 and resident in Genoa/Italy, he received the Laurea degree in Electronic Engineering in 1982 and the Doctorate in Electrical Communications in 1989. He currently teaches: *Signals and Systems for Telecommunications* and *Signal and Image Processing and Recognition*. His main field of research is the remote sensing image analysis for the generation of territory maps with thematic information such as: ground cover and use typologies, bio- and geo-physical parameter estimated values, ground changes occurred during multitemporal acquisitions. The most important applications refer to the civil protection support in connection with natural disasters, services concerned with renewable energy sources, environmental monitoring. A further research field is biomedical image analysis.

He coordinated several national and European research projects and he has been the scientific responsible for the Research Unit of the University of Genoa for numerous other ones.

He is author or coauthor of more than 200 scientific publications, about 60 of which were published in international journals. Since 2001 he is an Associate Editor of the journal *IEEE Transactions on Geoscience and Remote Sensing*. He chaired several international conferences and edited some special issues of the journal *IEEE Transactions on Geoscience and Remote Sensing and Proceeding of the IEEE*. He received the Best Paper Award at the *IEEE Workshop on Hyperspectral Image and Signal Processing* (2010).

His teaching during the last years concerns telecommunications, digital image processing and recognition, and the remote sensing.

He is a member of the *Telecommunications and Information Technologies* national association and, at the international level, of the *IEEE Geoscience and Remote Sensing Society*.

He has been a reviewer for several research projects funded by EU, national or foreign entities.

Dr. Serpico is a Committee Member of the Doctorate in *Science and Technologies for Electronic and Telecommunications Engineering*.

He is the Chairman of the *Institute of Advanced Studies in Information and Communication Technologies* (ISICT).

He is an IEEE Fellow.

## Research projects

- *ENDORSE – Energy downstream services – Providing energy components for GMES (funded by EU, FP7-SPACE, 2010-2013)*
- *SEAGOSS – Sistema informativo e di allertamento-gestione degli inquinamenti da oil slick e sedimenti (funded by Liguria Region, POR-FESR, 2012-2013)*
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#### Relevant recent publications

#### ARTICLES PUBLISHED IN INTERNATIONAL JOURNALS FROM 2008 TO 2013

1. G. Mercier, G. Moser, S. B. Serpico, "Conditional copula for change detection on heterogeneous SAR data," **IEEE Transactions on Geoscience and Remote Sensing**, Vol. 46, No. 5, May 2008, pp. 1428-1441.
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12. G. Moser, S.B. Serpico, J.A. Benediktsson, "Land-Cover Mapping by Markov Modeling of Spatial-Contextual Information in Very-High-Resolution Remote Sensing Images", **Proceedings of the IEEE**, vol. 101, no. 3, March 2013, pp. 631-651.
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