

Antonio Cicone

PERSONAL INFORMATION	DISIM Università degli Studi dell'Aquila via Vetoio, 67100, L'Aquila, Italy	cell: +39 3283410506 E-mail: antonio.cicone@univaq.it Web: www.cicone.com
RESEARCH INTERESTS	Applied Mathematics, Signal Processing, Spectral Properties of Sets of Matrices, Scientific Computing	
RESEARCH EXPERIENCE	Assistant Professor - RTD B since October 2020 Department of Information Engineering and Computer Science and Mathematics Università degli Studi dell'Aquila Post-doctoral Research Fellow of the INAF June 2020 – September 2020 Istituto di Astrofisica e Planetologia Spaziali Progetto CSES-Limadou. WP Caratterizzazione di sorgenti elettromagnetiche terrestri e algoritmi per analisi spettrale Istituto Nazionale di Astrofisica (INAF) Istituto di Astrofisica e Planetologia Spaziali Supervisor: Piero Diego Visiting Researcher of the University of Insubria January 2020 – May 2020 University of Insubria, Como Supervisor: Stefano Serra-Capizzano Visiting Assistant Professor November – December 2019 School of Mathematics, Georgia Institute of Technology Supervisor: Haomin Zhou Post-doctoral Research Fellow of the INdAM November 2017 – October 2019 Progetto S.I.E.S.: Strategic Initiatives for the Environment and Security WP5 Caratterizzazione delle sorgenti elettromagnetiche interne alla Terra Istituto Nazionale di Alta Matematica (INdAM) DISIM, Università degli Studi dell'Aquila Supervisor: Vincenzo Vespri Visiting Scientist of the GSSI April 2018 – August 2019 Gran Sasso Science Institute (GSSI) Supervisor: Nicola Guglielmi Marie Curie Post-doctoral Research Fellow of the INdAM September 2015 – August 2017 Istituto Nazionale di Alta Matematica (INdAM) DISIM, Università degli Studi dell'Aquila Advisor: Nicola Guglielmi Postdoctoral Fellow – Assegnista di ricerca July 2014 – August 2015 DISIM, Università degli Studi dell'Aquila Advisor: Nicola Guglielmi Visiting Assistant Professor August 2012 – June 2014 School of Mathematics, Georgia Institute of Technology Advisor: Haomin Zhou Postdoctoral Fellow January 2011 – June 2012 Mathematics Department, Michigan State University Advisor: Yang Wang Visiting Research Student October – December 2009 School of Mathematics, Georgia Institute of Technology Supervisor: Luca Dieci	
EDUCATION	<i>University of L'Aquila</i> , L'Aquila, Italy Ph.D. in Mathematics , Department of Mathematics April 28, 2011 Thesis: <i>Spectral Properties of Families of Matrices</i>	

Advisors: Nicola Guglielmi and Stefano Serra-Capizzano
Area of Study: Applied Mathematics

Laurea in Mechanical Engineering, summa cum laude April 26, 2006

Thesis: *Seals for special applications. Development of provisional models for Mechanical Face Seals and experimental validations*

Advisor: Roberto Cipollone

QUALIFICATIONS January 2020 – “Abilitazione Scientifica Nazionale (ASN) – II fascia in Analisi Numerica, Settore Concorsuale 01/A5”, 9 years Italian qualification to be an Associate Professor in Numerical Analysis

AWARDS AND GRANTS November 2019 – “contributo per l’organizzazione di incontri scientifici del Gruppo Nazionale di Calcolo Scientifico”, 1000 euro for the organization of the summer school and conference “Nonstationary Signal Analysis in Geophysics and other fields” - July 2020

February 2018 – Gruppo Nazionale di Calcolo Scientifico, six months grant – 1000 euro

September 2015 – “Marie Curie Post doctoral Fellowship of the Istituto Nazionale di Alta Matematica” with a project titled “Analysis and Application of Iterative Methods for Non-Stationary Signals”, two years grant – 100000 euro

October 2014 – “Progetto Giovani Ricercatori del Gruppo Nazionale di Calcolo Scientifico”, one year grant – 1500 euro

October 2011 – “Progetto Giovani Ricercatori del Gruppo Nazionale di Calcolo Scientifico”, one year grant – 1500 euro

September 2009 – “Fondazione Filauo” 3 months Research Fellowship – 5000 euro

2008 – Scholarship of the Italy-MIT consortium to be a MIT Visiting Student for one semester

April 2008 – “Assegno Regionale per attività di ricerca e alta formazione rivolto a dottorandi di ricerca con borsa, tipologia B. Intervento previsto nell’ambito del Progetto regionale Abruzzo Obiettivo 3 per il 2000-2006”, four months – 3000 euro

FELLOWSHIPS

- 11/2017 - 10/2019 – Post-doctoral Research Fellowships of the Istituto Nazionale di Alta Matematica INdAM Progetto S.I.E.S. Strategic Initiatives for the Environment and Security, Work Package 5 – Caratterizzazione delle sorgenti elettromagnetiche interne alla Terra.
- 09/2015 - 08/2017 – Marie Curie Post-doctoral Research Fellowships of the Istituto Nazionale di Alta Matematica INdAM
- 09/2014 - 08/2015 – Postdoctorial fellowship (Assegnista di Ricerca) of the DISIM, Università degli Studi dell’Aquila
- 08/2012 - 06/2014 – Visiting Research Fellow at Georgia Institute of Technology
- 01/2011 - 05/2012 – Visiting Research Fellow at Michigan State University
- 2011 & 2014 – GNCS (Gruppo Nazionale per il Calcolo Scientifico) Junior Research Fellowship
- 2009 – Fondazione Filauo Research Fellowship
- 2008 – Visiting Research Fellow presso il Dipartimento di Fisica e Matematica dell’Università dell’Insubria Sede di Como

RESEARCH VISITS January–May 2020 – Stefano Serra-Capizzano – University of Insubria (Italy)

October–December 2019 (1 month and half) – Haomin Zhou – Georgia Institute of Technology (USA)

April 2018–August 2019 – Gran Sasso Science Institute (Italy)

May 2018 (2 weeks) – Yang Wang – Hong Kong University of Science and Technology (Hong Kong)

May 2016 and December 2017 (2 months and half) – Haomin Zhou – Georgia Institute of Technology (USA)

January 2016 (1 month) – Hausdorff Research Institute for Mathematics (Germany)

October–November 2015 (2 months and half) – Haomin Zhou – Georgia Institute of Technology (USA)

August 2015 – Patrick Flandrin (2 weeks) – École normale supérieure de Lyon (France)

April–May 2015 (1 month and half) – Haomin Zhou – Georgia Institute of Technology (USA)

November 2014 (1 week) – Raphael Jungers – Université Catholique de Louvain (Belgium)

January, 2010 (1 week) – Stefano Serra-Capizzano – University of Insubria (Italy)

October–December 2009 (3 months) – Luca Dieci – Georgia Institute of Technology (USA)

September and November, 2008 – Antonio Pasini (2 weeks) – University of Siena (Italy)

April–July 2008 (4 months) – Stefano Serra-Capizzano – University of Insubria (Italy)

TEACHING
EXPERIENCE

University of Insubria, Como, Italy

Spring 2020

- Lecturer of the Ph.D. course “Nonlinear and nonstationary signal decomposition and analysis. Theoretical and numerical aspects and applications”

Gran Sasso Science Institute, L’Aquila, Italy

Fall 2014

- TA for the PhD intensive course on Numerical Methods

Georgia Institute of Technology, Atlanta, GA, USA

Spring and Summer 2014

- Instructor for Math 1502: Calculus II.

Spring, Summer, Fall 2013

- Instructor for Math 1522 : Linear Algebra for Calculus.

Fall 2012

- Instructor for Math 1501 SB1–2: Calculus I for Biology.

Michigan State University, East Lansing, MI, USA

Summer 2012

- Instructor for MTH 309: Linear Algebra I.
Website: <http://www.math.msu.edu/cicone/class/MTH309>

Spring 2012

- Instructor for MTH 305: Functions and Calculus for Elementary and Middle School Teachers.

Fall 2011

- Instructor for MTH 320: Analysis I.

ADVISING
EXPERIENCE

- Jingfang Liu
PhD student, Georgia Institute of Technology, Atlanta, Georgia, USA. Currently working at Oracle (USA)
- Eric Nana Asamoah
Graduate student, Università degli Studi dell'Aquila, L'Aquila, Italy
- Roberto Piersanti
Undergraduate student in Physics, Università degli Studi dell'Aquila, L'Aquila, Italy. Currently graduate student at University of Parma
- Erik Bates
Undergraduate student in Mathematics, Michigan State University, East Lansing, USA. Currently Ph.D. student at Stanford

SERVICES,
TEACHING AND
OUTREACH

- October 2019 - December 2019.
Creator and organizer of the series *I martedì della Ricerca* informal meetings among researchers of any discipline to initiate and foster interdisciplinary collaborations for the GSSI, the Università degli Studi dell'Aquila (L'Aquila, Italy). and the Laboratori Nazionali del Gran Sasso dell'INFN
- April 2018 - August 2019.
Collaborating to the European Grant Office of the GSSI (L'Aquila, Italy).
- April 2018 - August 2019.
Organizer of the *Seminars on EU Grants application* for the GSSI (L'Aquila, Italy).
- December 2018 - April 2019.
Creator and organizer of the *LaRicerca@AQ* informal meetings among researchers of any discipline to initiate and foster interdisciplinary collaborations (L'Aquila, Italy).
- December 2018 - August 2019.
Organizer of the *Postdoc and Ph.D. students Orientations* for the GSSI (L'Aquila, Italy).
- November 2018 - October 2019.
Organizer of the *Postdoc and Ph.D. students Orientations* for the DISIM of the Università degli Studi dell'Aquila (L'Aquila, Italy).
- February 2017 - October 2019.
Organizer of the *Seminars on EU Grants application* for the Università degli Studi dell'Aquila (L'Aquila, Italy).
- March 2017 - July 2018.
Co-organizer of the *Entrepreneurship Training* for the students and Ph.D. students of the Università degli Studi dell'Aquila (L'Aquila, Italy).
- March 2017 - July 2018.
Co-organizer of the *University Spin Off management* for the Università degli Studi dell'Aquila (L'Aquila, Italy).
- June 2012.
Co-organizer of the *Third Midwest Conference on Mathematical Methods for Images and Surfaces*, Michigan State University (East Lansing, MI, USA).
- November 28 - December 1, 2016.
Member of the Scientific panel of the International Workshop on Numerical Algorithms and Methods for Data Analysis and Classification. SITIS 2016 - The 12th International Conference on Signal Image Technology & Internet Based Systems - (Naples, Italy).

September 2016 – January 2017.

Organizer of the *Seminars on EU Grants application* for the Department of Information Engineering, Computer Science and Mathematics, Università degli Studi dell'Aquila (L'Aquila, Italy).

JOURNAL PAPERS

- L. Spogli, H. Ghobadi, A. Cicone, L. Alfonsi, C. Cesaroni, N. Linty, V. Romano, M. Cafaro. Adaptive phase detrending for GNSS scintillation detection: a case study over Antarctica. *IEEE Geoscience and Remote Sensing Letters*, 2021. doi:10.1109/LGRS.2021.3067727
- P. Barbe, A. Cicone, W. S. Li, H. Zhou. Time-frequency representation of non-stationary signals: the IMFogram. *Pure and Applied Functional Analysis*, 2021.
- A. Cicone, M. Piersanti, G. Consolini, M. Materassi, G. D'Angelo, P. Diego, P. Ubertini. Auroral oval layers detection by using CSES plasma and electric field data. *Nuovo Cimento C - Colloquia and Communications in Physics*, 2021.
- A. Cicone, H. Zhou. Numerical Analysis for Iterative Filtering with New Efficient Implementations Based on FFT. *Numerische Mathematik*, Volume 147, Issue 1, Pages 1-28, 2021. doi:10.1007/s00211-020-01165-5 (arXiv: 1802.01359)
- M. Piersanti, M. Materassi, R. Battiston, V. Carbone, A. Cicone, G. D'Angelo, P. Diego, P. Ubertini. Magnetospheric-Ionospheric-Lithospheric coupling model. 1. Observations during the August 5, 2018 Bayan Earthquake. *Remote Sensing*, Volume 12, 2020. doi:10.3390/rs12203299
- G. Piersanti, M. Piersanti, A. Cicone, P. Canofari, M. Di Domizio. An Inquiry into the Structure and Dynamics of Crude Oil Price Using the Fast Iterative Filtering Algorithm. *Energy Economics*, Volume 92, 2020. doi:10.1016/j.eneco.2020.104952
- A. Stallone, A. Cicone, M. Materassi. New insights and best practices for the successful use of Empirical Mode Decomposition, Iterative Filtering and derived algorithms. *Scientific Reports*, Volume 10, 2020. doi:10.1038/s41598-020-72193-2
- E. Papini, A. Cicone, M. Piersanti, L. Franci, P. Hellinger, S. Landi, A. Verdini. Multidimensional Iterative Filtering: a new approach for investigating plasma turbulence in numerical simulations. *Journal of Plasma Physics*, Volume 86, Issue 5, 2020. doi:10.1017/S0022377820001221 (arXiv: 2004.10040)
- H. Ghobadi, L. Spogli, L. Alfonsi, C. Cesaroni, A. Cicone, N. Linty, V. Romano, M. Cafaro. Disentangling ionospheric refraction and diffraction effects in GNSS raw phase through Fast Iterative Filtering technique. *GPS Solutions*, 2020. doi:10.1007/s10291-020-01001-1
- A. Cicone. Iterative Filtering as a direct method for the decomposition of non-stationary signals. *Numerical Algorithms*, Volume 85, Issue 3, Pages 811-827, 2020. doi:10.1007/s11075-019-00838-z (arXiv: 1811.03536)
- A. Cicone, P. Dell'Acqua. Study of boundary conditions in the Iterative Filtering method for the decomposition of nonstationary signals. *Journal of Computational and Applied Mathematics*, Volume 373, 112248, 2020. doi:10.1016/j.cam.2019.04.028. (arXiv: 1811.07610)
- L. Spogli, M. Piersanti, C. Cesaroni, M. Materassi, A. Cicone, L. Alfonsi, V. Romano, R.G. Ezquer. Role of the external drivers in the occurrence of low-latitude ionospheric scintillation revealed by multi-scale analysis. *Journal of Space Weather and Space Climate*, Volume 9, 2019. doi:10.1051/swsc/2019032
- A. Cicone, C. Garoni, S. Serra-Capizzano. Spectral and convergence analysis of the Discrete ALIF method. *Linear Algebra and its Applications*, Volume 580, Pages 62–95, 2019. doi:10.1016/j.laa.2019.06.021 (Online repository).
- M. Materassi, M. Piersanti, G. Consolini, P. Diego, G. D'Angelo, I. Bertello and A. Cicone. Stepping into the Equatorward Boundary of the Auroral Oval: preliminary results of multi scale statistical analysis. *Annals of Geophysics*, Volume 61, 55, 2019. doi:10.4401/ag-7801
- S. Sfarra, A. Cicone, B. Yousefi, C. Ibarra-Castanedo, S. Perilli, X. Maldague. Improving the detection of thermal bridges in buildings via on-site infrared thermography: the potentialities of innovative mathematical tools. *Energy & Buildings*, Volume 182, Pages 159–171, 2019. doi:10.1016/j.enbuild.2018.10.017

- A. Cicone, N. Guglielmi, V. Yu. Protasov. Linear switched dynamical systems on graphs. *Nonlinear Analysis: Hybrid Systems*. Volume 29, Pages 165–186, 2018. doi:10.1016/j.nahs.2018.01.006. (arXiv: 1607.00415)
- M. Piersanti, M. Materassi, A. Cicone, L. Spogli, H. Zhou, R. G. Ezquer. Adaptive Local Iterative Filtering: a promising technique for the analysis of non-stationary signals. *Journal of Geophysical Research – Space Physics*, Volume 123, Issue 1, Pages 1031–1046, 2018. doi:10.1002/2017JA024153
- A. Cicone, H.-T. Wu. How Nonlinear-Type Time-Frequency Analysis Can Help in Sensing Instantaneous Heart Rate and Instantaneous Respiratory Rate from Photoplethysmography in a Reliable Way. *Frontiers in Physiology* Volume 8, Article Number 701, 2017. doi:10.3389/fphys.2017.00701. (arXiv: 1701.02072)
- A. Cicone, H. Zhou. Multidimensional Iterative Filtering method for the decomposition of high-dimensional non-stationary signals. *Cambridge Core in Numerical Mathematics: Theory, Methods and Applications*, Volume 10, Issue 2, Pages 278–298, 2017. doi:10.4208/nmtma.2017.s05. (arXiv: 1507.07173)
- A. Cicone, J. Liu, H. Zhou. Hyperspectral Chemical Plume Detection Algorithms Based On Multidimensional Iterative Filtering Decomposition. *Proceedings of the Royal Society of London A*, Volume 374, Issue 2065, Article Number 20150196, 2016. doi:10.1098/rsta.2015.0196. (arXiv: 1512.01979)
- A. Cicone, J. Liu, H. Zhou. Adaptive Local Iterative Filtering for Signal Decomposition and Instantaneous Frequency analysis. *Applied and Computational Harmonic Analysis*, Volume 41, Issue 2, Pages 384–411, 2016. doi:10.1016/j.acha.2016.03.001. (arXiv: 1411.6051)
- R. M. Jungers, A. Cicone, N. Guglielmi. Lifted polytope methods for computing the joint spectral radius. *SIAM Journal on Matrix Analysis and Applications*. Volume 35, Issue 2, Pages 391–410, 2014. doi:10.1137/130907811
- A. Cicone, N. Guglielmi, S. Serra–Capizzano, M. Zennaro. Finiteness property of pairs of 2×2 sign-matrices via real extremal polytope norms. *Linear Algebra and its Applications*. Volume 432, Pages 796–816, 2010. doi:10.1016/j.laa.2009.09.022
- A. Cicone, S. Serra–Capizzano. Google PageRanking Problem: The Model and the Analysis. *Journal of Computational and Applied Mathematics*. Volume 234, Issue 11, Pages 3140–3169, 2010. doi:10.1016/j.cam.2010.02.005

CHAPTERS IN A BOOK

- A. Cicone. Nonstationary signal decomposition for dummies. *Advances in Mathematical Methods and High Performance Computing, Advances in Mechanics and Mathematics* 41, Springer Nature, 2019. doi:10.1007/978-3-030-02487-1_3 (arXiv)

CONFERENCE PAPERS

- H. Ghobadi, C. Savas, L. Spogli, F. DAVIS, A. Cicone, M. Cafaro. A Comparative Study of Different Phase Detrending Algorithms for Scintillation Monitoring. 2020 XXXIIIrd General Assembly and Scientific Symposium of the International Union of Radio Science, Rome, Italy, 2020, pp. 1-4. doi:10.23919/URSIGASS49373.2020.9232349.
- L. Spogli, M. Piersanti, C. Cesaroni, M. Materassi, A. Cicone, L. Alfonsi, V. Romano, R.G. Ezquer. Role of the external drivers in the occurrence of low-latitude ionospheric scintillation revealed by multi-scale analysis. *2019 URSI Asia-Pacific Radio Science Conference (AP-RASC)*, Article number 8738254, 2019. doi:10.23919/URSIAP-RASC.2019.8738254
- A. Cicone, A. D’Innocenzo, N. Guglielmi, L. Laglia. A sub-optimal solution for optimal control of linear systems with unmeasurable switching delays (*Proc. of 54-th IEEE CDC*) (arXiv: 1509.03351)

PREPRINTS

- A. Cicone, H.T. Wu. Convergence analysis of Adaptive Locally Iterative Filtering and SIFT method. (arXiv: 2005.04578). Submitted
- G. Barbarino, A. Cicone. Conjectures on spectral properties of ALIF algorithm.

Submitted

- S. Sfarra, A. Cicone, B. Yousefi, S. Perilli, L. Robol, X. P. V. Maldague. Maximizing the detection of thermal imprints in civil engineering composites after a thermal stimulus - The contribution of an innovative mathematical pre-processing tool: the 2D Fast Iterative Filtering algorithm. Philosophy, comparisons, numerical, qualitative and quantitative results. Submitted

PAPERS IN
PREPARATION

- One or two frequencies? The Iterative Filtering answers (with H. Zhou)
- IMFogram and its numerical analysis (with W. Li, H. Zhou)
- ALIF convergence and RIF method (with G. Barbarino)
- Multivariate Fast Iterative Filtering for the decomposition of nonstationary signals. (arXiv)

EDITORIAL
ACTIVITY

- **Guest Editor** – Special Issue of Sensors (ISSN 1424-8220) – Computational Methods in Imagery (CMI)

REFEREE

- Advances in Data Science and Adaptive Analysis
- Applied and Computational Harmonic Analysis
- Advances in Computational Mathematics
- Applied Mathematics and Computation
- Applied Sciences
- Biomedical Signal Processing and Control
- Energies
- Entropy
- Forum Mathematicum
- Frontiers in applied mathematics and statistics
- Frontiers in Physiology
- IEEE CDC
- IEEE Signal Processing Letters
- IEEE Transactions on Image Processing
- IEEE Transactions on Signal Processing
- Inverse Problem and Imaging
- Journal of Central South University
- Journal of Fourier Analysis and Applications
- Mathematical Reviews – MathSciNet
- Mathematical problems in Engineering
- Mechanical Systems and Signal Processing
- Mechanics and Industry
- Nonlinear Analysis: Hybrid Systems
- Neurocomputing
- NUMTA
- Science Progress
- Sensors
- Sensors Letters
- Signal Processing
- Transactions on Image Processing
- Transactions on Signal Processing

MEMBERSHIP

- Gruppo Nazionale per il Calcolo Scientifico (GNCS), Istituto Nazionale di Alta Matematica Francesco Saveri (INdAM), Sezione di Analisi Numerica. Since 2008
- International Linear Algebra Society (ILAS) since 2010

SOFTWARE

- Multivariate Fast Iterative Filtering - MFIF (MATLAB).
- Hard Thresholding Fast Iterative Filtering - htFIF (MATLAB).
- Direct Fast Iterative Filtering - dFIF (MATLAB).
- Fast Iterative Filtering - FIF (MATLAB).

- Multidimensional Iterative Filtering (MATLAB).
- Instantaneous Frequency evaluation (MATLAB).
- Adaptive Local Iterative Filtering method - ALIF (MATLAB).
- Iterative Filtering method equipped with a Fokker-Planck filter (MATLAB).
- Joint Spectral Radius approximation through conitopes - part of Jungers' JSR Toolbox (MATLAB).
- Joint Spectral Radius approximation algorithm (MATLAB).

INDUSTRIAL
RESEARCH
EXPERIENCES

Meccanotecnica Umbra, Campello sul Clitunno, Italy January to March 2006
Research & Development Department

- Analysis of thermal, mechanical and wear problems. Development of provisional models for mechanical face seals behavior and implementation in C#.

PLENARY TALKS
AT CONFERENCES

- *Non-stationary and non-linear signals: a new promising tool for their analysis.* Conference on Modern Mathematical Methods and High Performance Computing in Science and Technology, (M3HPCST) (Gaziabad in Utter Pradesh, India). January 5, 2018.

INVITED TALKS
AND CONFERENCE
PRESENTATIONS

- *Fast and Adaptive Local Iterative Filtering techniques for the decomposition of nonstationary signals: State of the art and open problems* Georgia State University (Atlanta, GA, USA). November 05, 2019.
- *Nonstationary signal analysis and decomposition via Fast and Adaptive Local Iterative Filtering: State of the art and open problems* School of Mathematics, Georgia Tech (Atlanta, GA, USA). November 04, 2019.
- *Characterization of the Earth internal electromagnetic sources.* CIME - Applied Mathematical Problems in Geophysics (Cetraro, Italy). July 02, 2019.
- *Fast Iterative Filtering and Adaptive Local Iterative Filtering. A new generation of algorithms for the decomposition and analysis of nonlinear and nonstationary signals.* Arcetri Observatory INAF (Firenze, Italy). June 14, 2019.
- *Adaptive Local Iterative Filtering and Fast Iterative Filtering. New ways to decompose and analyze nonlinear and nonstationary signals.* Centre of Excellence CETEMPS (L'Aquila, Italy). May 2, 2019.
- *Spectral and convergence analysis of the discrete Adaptive Local Iterative Filtering method by means of Generalized Locally Toeplitz sequences.* SIAM Conference on Applied Linear Algebra 2018 (Hong Kong). May 4–8, 2018.
- *Spectral and convergence analysis of the discrete Adaptive Local Iterative Filtering method by means of Generalized Locally Toeplitz sequences.* INdAM Meeting: Structured Matrices in Numerical Linear Algebra: Analysis, Algorithms and Applications (Cortona, Italy). September 4–8, 2017.
- *Multidimensional Iterative Filtering method. A new way to decompose high-dimensional and non-stationary signals.* SIMAI congress 2016 (Milano, Italy). September 15, 2016.
- *Multidimensional Iterative Filtering method for the decomposition of high-dimensional non-stationary signals.* SIAM Conference on Imaging Science 2016 (Albuquerque, NM). May 25, 2016.
- *Tecniche di scomposizione di segnali non lineari e non stazionari bidimensionali ed applicazioni.* Convegno 2016 del GNCS (Montecatini Terme, Italy). February 2, 2016.
- *A new approach to the decomposition and analysis of nonlinear and nonstationary signals: the Adaptive Local Iterative Filtering method.* Hausdorff Trimester Program on Mathematics of Signal Processing, HIM (Bonn, Germany). January 20, 2016.
- *State of the art and open problems in the decomposition of nonlinear and non-stationary signals.* XX Congresso UMI (Siena, Italy). September 10, 2015.
- *What is and how to compute efficiently the Markovian Joint Spectral Radius?* School of Mathematics, Georgia Tech (Atlanta, GA, USA). April 20, 2015.

- *Adaptive Local Iterative Filtering: A new way to decompose and analyze non-linear and nonstationary signals.* ICTEAM Institute, Université catholique de Louvain (Louvain-la-Nueve, Belgium). November 27, 2014.
- *The Joint Spectral Radius and its approximation.* School of Mathematics, Georgia Institute of Technology (Atlanta, GA, USA). November 12, 2012.
- *Piecewise smooth functions reconstruction from non-uniform noisy Fourier data.* Third Midwest Conference on Mathematical Methods for Images and Surfaces, Michigan State University (East Lansing, MI, USA). June 15, 2012.
- *The Google PageRank: the Model and the Analysis.* Department of Mathematics, Michigan State University (East Lansing, MI, USA). April 9, 2012.
- *Spectral properties of families of matrices: Algorithms for the approximation of the Lyapunov Exponent.* Department of Physics and Mathematics, University of Insubria (Como, Italy). January 15, 2010.
- *The coordination of autonomous agents: the Consensus Problem.* Department of Mathematics and Computer Science, University of Siena (Siena, Italy). November 10, 2008.
- *Google PageRank: model pathologies and possible solutions.* Department of Mathematics and Computer Science, University of Siena (Siena, Italy). September 29, 2008.

CONTRIBUTED
LECTURES AT
CONFERENCES

- *Nonstationary Signals Analysis: New Methods and Open Problems.* 2021 SIAM Conference on Applied Linear Algebra (online). May 17–21, 2021.
- *Sounding plasma turbulence at sub-ion scales with Fast Iterative Filtering in space and time.* European Geosciences Union General Assembly 2021 (online). April 19–30, 2021.
- *On the phase detrending to disentangle refraction and diffraction on GNSS signals: a case study over Antarctica.* European Geosciences Union General Assembly 2021 (online). April 19–30, 2021.
- *Fast Iterative Filtering: a new, fast and robust decomposition method for nonlinear and nonstationary processes.* European Geosciences Union General Assembly 2021 (online). April 19–30, 2021.
- *Tracking the split: a non-linear iterative approach to the monitoring of recent SAA evolution.* European Geosciences Union General Assembly 2021 (online). April 19–30, 2021.
- *Magnetospheric–Ionospheric–Lithospheric coupling model. Observations during the August 5, 2018 Bayan Earthquake.* European Geosciences Union General Assembly 2021 (online). April 19–30, 2021.
- *Auroral oval layers detection by using CSES plasma and electric field data.* 106 Congresso Nazionale Società Italiana di Fisica (online). September 14–18, 2020.
- *Multiscale analysis of Hall MHD and Hybrid PIC simulations of plasma turbulence: structures or waves?.* European Geosciences Union General Assembly 2020 (online). May 4–8, 2020.
- *New insights and best practices for the successful use of EMD, Iterative Filtering and derived algorithms.* European Geosciences Union General Assembly 2020 (online). May 4–8, 2020.
- *Disentangling ionospheric refraction and diffraction effects in GNSS raw phase through Fast Iterative Filtering technique.* American Geophysical Union Fall meeting 2019 (San Francisco, USA). December 9–13, 2019
- *Nonstationary signal decomposition: the fast iterative filtering algorithm and open problems.* Aspects of Time Frequency Analysis (Torino, Italy). June 25–27, 2019
- *Multivariate Iterative Filtering as a stable and fast alternative technique to Multivariate EMD for multidimensional nonstationary signals decomposition.* European Geosciences Union General Assembly 2019 (Vienna, Austria). April 7–12, 2019.
- *Nonstationary signals decomposition: an overview on the state of the art, current applications and possible future directions of research.* Due Giorni di Algebra

- Lineare Numerica e Applicazioni (Roma, Italy). February 18–19, 2019.
- *New methods for the decomposition of non stationary signals and their mathematical properties: iterative filtering and adaptive local iterative filtering algorithms.* MicroLocal and Time–Frequency Analysis 2018 (Torino, Italy). July 2–6, 2018.
 - *Adaptive Local Iterative Filtering: a promising technique for the analysis of non-stationary signals.* European Geosciences Union General Assembly 2018 (Vienna, Austria). April 8–13, 2018.
 - *On the numerical convergence and properties of the Iterative Filtering method for the analysis of nonlinear and nonstationary signals.* Due Giorni di Algebra Lineare Numerica e Applicazioni (Padova, Italy). February 8–9, 2018.
 - *The Iterative Filtering method for the decomposition of nonlinear signals: new insights into its properties.* Aspects of Time–Frequency Analysis (Torino, Italy). June 5–7, 2017.
 - *Convergenza numerica e proprietà del metodo Filtraggio Iterativo per lo studio di segnali nonlineari e nonstazionari.* Due Giorni di Algebra Lineare Numerica (Como, Italy). February 16–17, 2017.
 - *Multi-scale statistical analysis of ionospheric scintillation.* Congresso Nazionale della Società Italiana di Fisica (Padova, Italy). September 28, 2016.
 - *Adaptive Local Iterative Filtering: A new way to decompose and analyze nonlinear and nonstationary signals.* Joint DMV and GAMM Annual Meeting 2016 (Braunschweig, Germany). March 7–11, 2016.
 - *A sub-optimal solution for optimal control of linear systems with unmeasurable switching delays.* 54th IEEE Conference on Decision and Control (Osaka, Japan). December 15–18, 2015.
 - *The Markovian Joint Spectral Radius: what it is and how to compute it efficiently.* SIAM Conference on Applied Linear Algebra (Atlanta, USA). October 26–30, 2015.
 - *How to compute efficiently the Markovian Joint Spectral Radius?* GAMM 86th Annual Scientific Conference (Lecce, Italy). March 23–27, 2015.
 - *Gas detection by means of Adaptive Local Iterative Filtering.* Algorithms for Threat Detection Program Review (Boulder, Colorado, USA). March 10–12, 2014.
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