ALL. B

JLENIA TOPPI
Curriculum Vitae

Place: ROME
Date: 25/07/2018

Part II – Education

Type	Year	Institution	Notes
PhD	2013	Alma Mater Studiorum, Bologna University	PhD in BioEngineering
Master degree	2009	Sapienza University of Rome	Master degree in Biomedical Engineering; mark 110/110 cum laude
Bachelor degree	2006	Sapienza University of Rome	Bachelor degree in Biomedical Engineering; mark 110/110 cum laude

Part III – Appointments

IIIA – Academic Appointments

Start	End	Institution	Position
01/12/2017	present	Dept. of Computer, Control and Management Engineering, "Antonio Ruberti", Sapienza, University of Rome, Italy	POST-DOC (assegnista di ricerca) in ING-INF/06
01/08/2016	31/07/2017	Dept. of Computer, Control and Management Engineering, "Antonio Ruberti", Sapienza, University of Rome, Italy	POST-DOC (assegnista di ricerca) in ING-INF/06
01/08/2015	31/07/2016	Dept. of Computer, Control and Management Engineering, "Antonio Ruberti", Sapienza, University of Rome, Italy	POST-DOC (assegnista di ricerca) in ING-INF/06
01/08/2014	31/07/2015	Dept. of Computer, Control and Management Engineering, "Antonio Ruberti", Sapienza, University of Rome, Italy	POST-DOC (assegnista di ricerca) in ING-INF/06

01/07/2013	30/06/2014	Dept. of Computer, Control and Management Engineering, "Antonio Ruberti", Sapienza, University of Rome, Italy	POST-DOC (assegnista di ricerca) in ING-INF/06

IIIB – Other Appointments

Start	End	Institution	Position
01/01/2013	30/06/2013	Santa Lucia Foundation IRCCS, Rome, Italy	**Research fellow** (Borsista) with a grant on "The study of motor and cognitive recovery realized by means of the prolonged use of EEG-based Brain Computer Interfaces in post-stroke patients".

Part IV – Teaching experience

Year	Institution	Lecture/Course
2014-present	Sapienza University of Rome	**Tutorial activity** at the MSc program in Biomedical Engineering for the following academic courses: Analisi dei Biosistemi Complessi (SSD ING-INF/06) from A.A.2011/12 to A.A. 2014/15. Neuroscienze industriali (SSD ING-INF/06) from A.A. 2013/14 to A.A. 2017/2018. Elaborazione dei segnali biomedici II (SSD ING-INF/06) from A.A.2015/16 to A.A. 2017/18. Metodi Avanzati per l'analisi dei dati biomedici (SSD ING-INF/06) from A.A. 2015/16 to A.A. 2017/18. Modelli di sistemi biologici (SSD ING-INF/06) from A.A. 2016/17 to A.A. 2017/18.
2010-present	Sapienza University of Rome	Co-supervisor of **3 bachelor, 18 master and 1 PhD theses** in Biomedical Engineering (SSD ING-INF/06).

Part V - Society memberberships, Awards and Honors

Year	Title
2012	Open Finalist at the Student Paper Competition of 34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego (USA), Aug. 28 – Sept. 1, 2012, with the work "Describing Relevant Indices from the Resting State Electrophysiological Networks".
2012	Young Paper Award at Terzo Congresso Nazionale di Bioingegneria, Rome (Italy), June 26-29, 2012, with the work "Assessing Functional Connectivity Patterns by Asymptotic Distribution of Partial Directed Coherence".

2011	Second Best Poster with the title "The issue of multiple comparison corrections in a study of high resolution EEG" at 8th Edition of the International Summer School on Biomedical Signal Processing of the IEEE Engineering in Medicine and Biology Society (IEEE-EMBS), Jun 26 – July 03, 2011, Certosa di Pontignano, Siena, Italy.
2011-present	Standard Member of IEEE - Engineering in Medicine and Biology Society
2014-present	Post-doc member of Gruppo Nazionale di Bioingegneria
2015-present	Junior Member of the Technical Committee of Biomedical Signal Processing of the IEEE EMBS

Part VI - Funding Information

IIIA – Grants as Principal Investigator (PI)

Year	Title	Program	Grant value
2018-present	DISCLOSE: A new toolbox for the EEG-based assessment of patients with disorder of consciousness	Promobilia Foundation	15000€
2015-2016	Towards an EEG-based model of working memory deficits after stroke: diagnosis and rehabilitation	Avvio alla ricerca, Progetti di Ateneo, Sapienza Università di Roma	2000€

IIIB – Grants as Investigator

| Year	Title	Program
2018-present	Disorders of Consciousness (DoC): enhancing the transfer of knowledge and professional skills on evidence-based interventions and validated technology for a better management of patients	H2020-MSCA-RISE-2017
2017-present	EMBRACING: Estimating Multiple-BRain connectivity in Autism during Cooperative INteraction: a new tool for realtime hyperscanninG	Progetti di Ateneo, Sapienza
2016-present	MIME-BCI: Mindfulness Meditation training supported by BrainComputer Interfaces	Progetti di Ateneo, Sapienza
2015-2018	APOSTROPHES - Assisting Post Stroke Rehabilitation through real time Physiological Signal analysis	Progetti di Ateneo, Sapienza
2013-2017	Brain-to-brain connectivity from simultaneous neuroelectric and autonomic multi-subjects recordings as a new tool to study human social interaction	FIRB - MIUR
2011-2015	CONTRAST: An individually adaptable, BNCI-based, remote controlled Cognitive Enhancement Training for successful rehabilitation after stroke including home support and monitoring	FP7-ICT, European Committee
2010-2013	DECODER: Deployment of Brain-Computer Interfaces for the Detection of Consciousness in Non-Responsive Patients	FP7-ICT, European Committee

Part VII – Editorial Activity

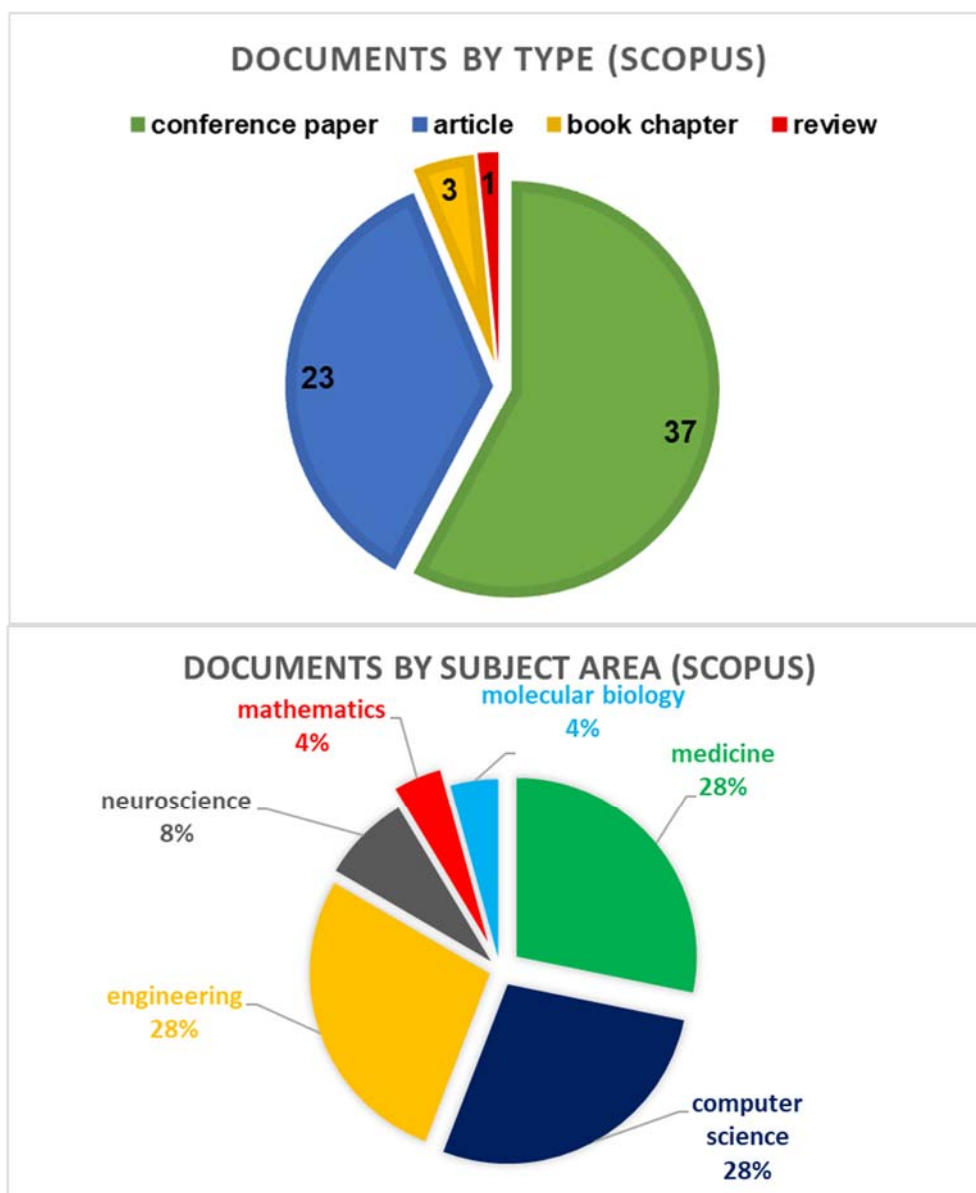| Year	Title
2018-present	**Academic Editor** for Computation and Mathematical Methods in Medicine journal
2012	**Guest editor** for a Special Issue on International Journal of Bioelectromagnetism
2013	**Guest Editor** for the student paper competition at 35th International Conference IEEE-EMBS, Osaka (Japan)
2010-present	**Reviewer** for: IEEE Transactions on Biomedical Engineering, IEEE Transactions on Neural Systems & Rehabilitation Engineering, Brain Topography, Journal of Neuroscience Methods, Neuroimage, Journal of Neural Engineering, Clinical Neurophysiology

Part VIII – Research Activities

Keywords	Brief Description
High resolution EEG Signal processing Brain connectivity Graph theory Brain mapping Hyperscanning Brain-computer interface Event-related potentials Stroke Disorders of consciousness	Dr. Toppi's research interests include the development and implementation of new approaches for high resolution EEG signal processing, with a special focus on brain mapping and brain connectivity in healthy and pathological individuals. **1. Brain mapping** She contributed to the development of the following methodologies: i) adaptation of the current algorithms for the analysis of event-related potentials in healthy subjects to the non-idealities of data from patients with disorders of consciousness (Risetti et al., Front Hum Neurosci, 2013 – DECODER project) and ii) source localization approaches aiming at increasing the low spatial resolution of EEG technique and thus identifying brain areas acting as sources in the recorded neuroelectrical activity. Such methods have been then applied to healthy subject with the aim to investigate brain activities associated to imagination (Toppi et al., JNE, 2014) to face perception (Vecchiato et al., Comp Math Meth Med, 2014) and to economic decision making (Vecchiato et al., J. Neurosci Meth, 2010, Vecchiato et al., Med Biol Eng Comp, 2011). **2. Brain connectivity** She focused on the development of methodologies for stationary and time-varying connectivity estimation and their related statistical assessment against chance (Toppi et al., IEEE Trans Biom Eng, 2016, Toppi et al., Comp Mat Met Med, 2012). Such approaches have been used to reconstruct the brain circuits at the basis of resting brain (Petti et al., CIN, 2016) as well as during active cognitive processes (Toppi et al., Front Hum Neurosci, 2018, Toppi et al., Neuroimage, 2016). In social neuroscience field, within Prof. Astolfi's group, she was pioneer in the analysis of brain to brain connectivity estimated from hyperscanning EEG acquired (simultaneously) from interacting subjects (Ciaramidaro, Toppi, Sci Rep, 2018, Toppi, PlosOne, 2016, Astolfi et al., IEEE Int Sys, 2011, Astolfi et al., Brain Top, 2010). Moreover, in the context of CONTRAST project, she employed graph theory indices for quantifying brain networks measures and thus extracting indices to be

used as outcome measures in cognitive/motor rehabilitation treatments based on Brain Computer Interface after stroke (Pichiorri et a., Ann of Neu, 2015).

DOCUMENTS BY KEYWORDS (SCOPUS)
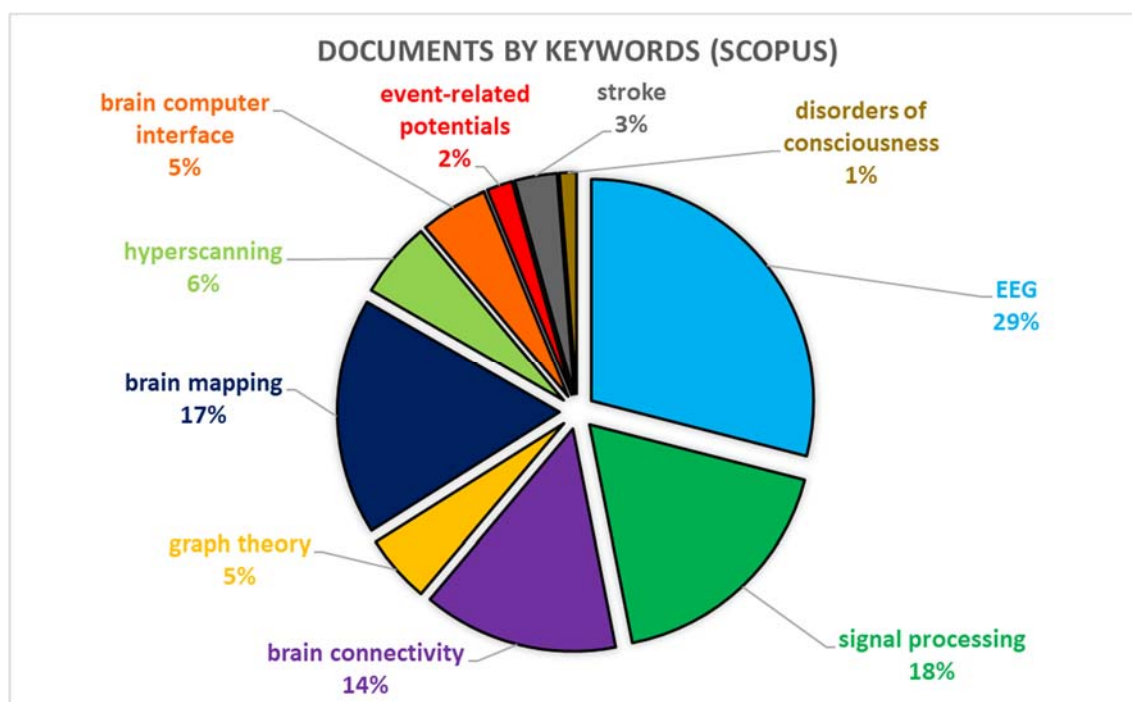
Part IX – Summary of Scientific Achievements

Product type	Number	Data Base	Start	End
Papers [international]	23	Scopus	2010	2018
Conference papers indexed on medline	37	Scopus	2010	2018
Book chapters	3	Scopus	2010	2018
Review	1	Scopus	2010	2018

DOCUMENTS BY TYPE (SCOPUS)

■ conference paper   ■ article   ■ book chapter   ■ review

3   1

23

37

DOCUMENTS BY SUBJECT AREA (SCOPUS)

mathematics
4%

molecular biology
4%

medicine
28%

neuroscience
8%

engineering
28%

computer
science
28%

Total Impact factor	47.23	ISI
Average Impact factor**	2.05	ISI
Total Citations	686	Scopus
Average Citations per Product	10.55	Scopus
Hirsch (H) index	13	Scopus
Normalized H index*	1.63	Scopus

*H index divided by the academic seniority (time span from the first publication).
**averaged over 23 documents categorized as "article" in SCOPUS

Citations per year (SCOPUS)

[Bar chart showing citations per year from 2010 to 2018, with a red dotted trend line. Values approximately: 2010 ~3, 2011 ~10, 2012 ~30, 2013 ~42, 2014 ~103, 2015 ~107, 2016 ~124, 2017 ~177, 2018 ~82]
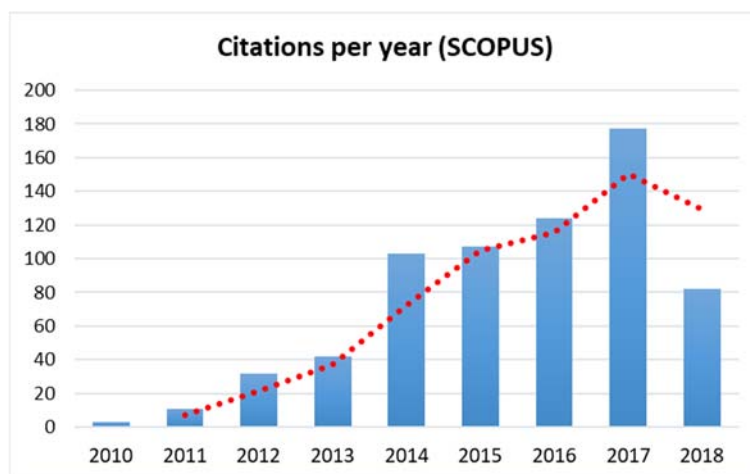
Part X – Participation to national and international conferences (speaker)

XA – Oral presentations

Date	Conference	Title
2018	1st DOCMA workshop, Valencia, Spain	Neuroelectrical imaging and brain connectivity in patients with DOC: analysis of resting state and event-related potentials
2016	38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Orlando, USA.	Measuring the Agreement between Brain Connectivity Networks
2015	37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Milano, Italia	Graph theory in brain-to-brain connectivity: A simulation study and an application to an EEG hyperscanning experiment
2014	36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Chicago, USA	Investigating Statistical Differences in Connectivity Patterns Properties at Single Subject Level: a New Resampling Approach
2012	Terzo Congresso Nazionale di Bioingegneria, Rome, Italy	Assessing Functional Connectivity Patterns by Asymptotic Distribution of Partial Directed Coherence
2012	34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego (USA)	Describing Relevant Indices from the Resting State Electrophysiological Networks
2011	5th International Brain-Computer Interface Conference, Graz (Austria)	Exploring electrophysiological correlates of mental imagery paradigms borrowed from fMRI domain: what can we learn for BCI application?
2010	International Conference INSTICC on Biosignals, Rome, Italy	Spectral analysis of the cerebral activity during voluntary modulation of mental states: a high-resolution EEG study

XB – Poster presentations

Date	Conference	Title
2018	Sesto congresso nazionale di Bioingegneria, Milan, Italy	Windowed Wavelet Filter: a New Approach to Identify Event-Related Potentials in Disorders of Consciousness
2016	Quinto congresso nazionale di Bioingeneria, Naples, Italy	Towards Real Time Connectivity Estimation: A New Approach Based on Ridge Regression
2014	Quarto Congresso Nazionale di Bioingegneria, Pavia, Italy	Time Varying Effective Connectivity for Evaluating the Efficacy of a Cognitive Rehabilitation Treatment
2012	Terzo Congresso Nazionale di Bioingegneria, Roma, Italia	Time-varying functional connectivity estimation by means of a General Linear Kalman Filter
2011	33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Boston (USA)	Study of the Functional Hyperconnectivity between Couples of Pilots during Flight Simulation: an EEG Hyperscanning Study
2011	European Congress on Clinical Neurophysiology, Rome, Italy	Spatio-Temporal Discrimination of Cortical Activities Involved in Complex Imagery Tasks: A Study Of High Resolution EEG
2010	Secondo Congresso Nazionale di Bioingegneria, Torino, Italy	Estimation of the cortical spectral activity during mental imagery tasks: an application of the multiple comparison corrections in a high-resolution EEG study
2010	TOBI Workshop II - Translational Issues in BCI Development: User Needs, Ethics, and Technology Transfer, Rome, Italy	Tracking the brain activity during mental imagery tasks: an application of multiple comparisons corrections in a high-resolution EEG

Part XI – National and international research collaborations

Start	End	Institution (coordinator)	Products
2012	present	Bioengineering and Bioinformatics Lab, Department of Computer, Control and Management Engineering, University of Rome "Sapienza" (Prof. Laura Astolfi, Prof. Febo Cincotti)	Collaboration aiming at the development of advanced methodologies for EEG signal processing and machine learning. Such collaboration allowed me to publish several articles in bioengineering fields and to participate to different national (FIRB, Progetti di Ateneo) and European projects (DOCMA funded by H2020-EU committee).
2010	present	Neuroelectrical Imaging and Brain Computer Interface Laboratory, IRCCS Fondazione Santa Lucia, Rome, Italy (Dr. Donatella Mattia)	Such collaboration has been strengthened by an official bilateral agreement between the Department (Dept. of Computer, Control and Management Engineering of Sapienza University of Rome and the IRCCS Fondazione Santa Lucia. This contributed to the establishment of a multi-disciplinary team composed by neurologists, psychologists and engineers with the aim to employ bioengineering expertise in the study of

			healthy and pathological brain mechanisms. Such collaboration allowed me to publish several articles in clinical neuroscience and bioengineering fields and to participate to different European projects (DECODER and CONTRAST) funded by FP7-EU committee.
2010	2016	Dept. of Molecular Medicine, Sapienza University of Rome (Prof. Fabio Babiloni)	Collaboration on the study of social behaviour in civil pilots. 2 abstracts indexed in medline (IEEE EMBS 2011, 2012) and 1 paper on journal (Toppi et al., PLOS one, 2016). Collaboration within the national project BRAINSHIELD: Unusual - upset attitudes during military and civil flights: possibility for an anticipatory control of human errors during their occurrences by using brain computer interfaces
2012	present	Post-coma Unit, IRCCS Fondazione Santa Lucia, Rome, Italy (Dr. Rita Formisano)	EEG signal processing as support to diagnosis and prognosis of DoC patients. 2 papers on journal (Risetti et al., Front. Hum. Neurosci, 2013 and Toppi et al., IEEE Trans Biom Eng., 2016)
2012	present	Institute of Medical Psychology and Medical Sociology, University of Kiel, Germany (Dr. Michael Siniatchkin) and Department of Child and Adolescent Psychiatry, Psychosomatics, and Psychotherapy, Goethe-University, Frankfurt/M, Germany (Dr. Christine Freitag).	Collaboration on the study of social relationships in humans by means of EEG hyperscanning. 3 abstracts indexed on medline (IEEE-EMBS, 2014, 2015) and 1 paper on journal (Ciaramidaro, Toppi et al., Sci Rep, 2018)
2012	2016	Electrical and Computer Engineering, University of Canterbury, Christchurch, New Zealand (Prof. Richard Jones)	Collaboration on the use of EEG signals for early detection of behavioral microsleeps. 1 abstract indexed on medline (IEEE-EMBS 2012) and 1 paper on journal (Toppi et al., Neuroimage, 2016).

Part XII– Selected Publications

first authorship equally divided

#	Authors	Title	Year	Journal	Vol(Iss):Pages	Citations	IF
1	Ciaramidaro*, **Toppi J.***, Casper C., Freitag C.M., Siniatchkin M., Astolfi L.	Multiple-Brain Connectivity during Third Party Punishment: An EEG Hyperscanning Study	2018	Scientific Reports	8(1):6822-35	0	4.122
2	**Toppi J.**, Astolfi L., Risetti M., Anzolin A., Kober S.E., Wood G., Mattia D.	Different topological properties of EEG-derived networks describe working memory phases as revealed by graph theoretical analysis	2018	Frontiers in Human Neuroscience	11(637)	0	2.871
3	**Toppi J.**, Mattia D., Risetti M., Formisano R., Babiloni F., Astolfi L.	Testing the significance of connectivity networks: Comparison of different assessing procedures	2016	IEEE Transactions on Biomedical Engineering	63(12):2461-73	7	3.577
4	Petti M., **Toppi J.**, Babiloni F., Cincotti F., Mattia D., Astolfi L.	EEG Resting-State Brain Topological Reorganization as a Function of Age	2016	Computational Intelligence and Neuroscience	6243694	3	1.215
5	**Toppi J.**, Astolfi L., Poudel G.R., Innes C.R.H., Babiloni F., Jones R.D.	Time-varying effective connectivity of the cortical neuroelectric activity associated with behavioural microsleeps	2016	NeuroImage	124:421-32	8	5.835
6	**Toppi J.**, Borghini G., Petti M., He E.J., De Giusti V., He B., Astolfi L., Babiloni F.	Investigating cooperative behavior in ecological settings: An EEG hyperscanning study	2016	PLoS ONE	11(4)	22	2.806

#	Authors	Title	Year	Journal	Vol(Iss):Pages	Citations	IF
7	Pichiorri F., Morone G., Petti M., **Toppi J.**, Pisotta I., Molinari M., Paolucci S., Inghilleri M., Astolfi L., Cincotti F., Mattia D.	Brain-computer interface boosts motor imagery practice during stroke recovery	2015	Annals of Neurology	77(5):851-65	90	9.638
8	**Toppi J.**, Risetti M., Quitadamo L.R., Petti M., Bianchi L., Salinari S., Babiloni F., Cincotti F., Mattia D., Astolfi L.	Investigating the effects of a sensorimotor rhythm-based BCI training on the cortical activity elicited by mental imagery	2014	Journal of Neural Engineering	11(3)	13	3.295
9	Vecchiato G., **Toppi J.**, Maglione A.G., Astolfi L., Mattia D., Colosimo A., Babiloni F.	Neuroelectrical correlates of trustworthiness and dominance judgments related to the observation of political candidates	2014	Computational and Mathematical Methods in Medicine	434296	1	0.766
10	Risetti M., Formisano R., **Toppi J.**, Quitadamo L.R., Bianchi L., Astolfi L., Cincotti F., Mattia D.	On ERPs detection in disorders of consciousness rehabilitation	2013	Frontiers in Human Neuroscience	7(775)	36	2.895
11	**Toppi J.**, De Vico Fallani, Vecchiato G., Maglione A.G., Cincotti F., Mattia D. Salinari S., Babiloni F., Astolfi L.	How the statistical validation of functional connectivity patterns can prevent erroneous definition of small-world properties of a brain	2012	Computational and Mathematical Methods in Medicine	130985	38	0.791

connectivity
network

#	Authors	Title	Year	Journal	Vol(Iss):Pages	Citations	IF
12	Astolfi L., **Toppi J.**, De Vico Fallani, Vecchiato G., Cincotti F., Mattia D., Salinari S., He B., Babiloni F.	Imaging the social brain by simultaneous hyperscanning during subject interaction	2011	IEEE Intelligent Systems	26(5):38-45	43	2.154
13	Vecchiato G., **Toppi J.**, Astolfi L., De Vico Fallani Cincotti F., Mattia D., Babiloni F.	Spectral EEG frontal asymmetries correlate with the experienced pleasantness of TV commercial advertisements	2011	Medical and Biological Engineering and Computing	49(5):579-583	60	1.878
14	Astolfi L., **Toppi J.**, De Vico Fallani Vecchiato G., Salinari S., Mattia D., Cincotti F., Babiloni F.	Neuroelectrical hyperscanning measures simultaneous brain activity in humans	2010	Brain Topography	23(3):243-256	73	3.288
15	Vecchiato G., De Vico Fallani Astolfi L., **Toppi J.**, Cincotti F., Mattia D., Salinari S., Babiloni F.	The issue of multiple univariate comparisons in the context of neuroelectric brain mapping: An application in a neuromarketing experiment	2010	Journal of Neuroscience Methods	191(2):283-289	24	2.1