EUROPEAN CURRICULUM VITAE

CURRICULUM RESO SOTTO FORMA DI DICHIARAZIONE SOSTITUTIVA DI ATTO DI NOTORIETÀ, AI SENSI DEGLI ARTT. 46 E 47 DEL D.P.R. 445/2000 (SI ALLEGA FOTOCOPIA DOCUMENTO DI IDENTITÀ VALIDO). AUTORIZZAZIONE AL TRATTAMENTO DEI DATI (AI SENSI DELL'ART. 13 D.LGS. N. 196/2003 E IN SEGUITO ALL'ENTRATA IN VIGORE DEL REGOLAMENTO UE NR. 679/2016. CONSAPEVOLE, SECONDO QUANTO PRESCRITTO DALL'ART. 76 DEL D.P.R. 445/2000, DELLA RESPONSABILITÀ PENALE CUI PUÒ ANDARE INCONTRO IN CASO DI DICHIARAZIONE MENDACE, FALSITÀ NEGLI ATTI ED USO DI ATTI FALSI, IL SOTTOSCRITTO DICHIARA SOTTO LA PROPRIA RESPONSABILITÀ QUANTO SEGUE NEL CURRICULUM VITAE REDATTO SECONDO FORMATO EUROPEO:

PERSONAL INFORMATION

Name	**SPRUGNOLI, GIULIA**
Address	**VIA VALDAMBRINO 4, 53100, SIENA, (SI), Italy**
Telephone number	**+39-3491912039**
E-mail	**gsprugnoli@mgh.harvard.edu**
Nationality	Italian
Date of birth	01/01/1990

EDUCATION AND TRAINING

• Name and type of education institute	September 2004 - July 2009 I. I. S. S. Poliziano (**Scientific High School**, Montepulciano, Siena, Italy)
• Key subjects	Maths, Physics, Science, Informatics • POMUS-Centoclassi Projects (last year of high school): organized by Engineering Faculty of Siena (discussion and application of mathematical and physical theories with faculty's professors)
• Qualification	Scientific High School Diploma with a score of 98/100
• Name and type of education institute	September 2009 – July 2015 **Medicine and Surgery University**, Siena, Italy
• Training experience	• 3-months internship (October 2010 - December 2010) at the Department of Biochemistry (Le Scotte Hospital, University of Siena, Prof. Roberto Leoncini): first approach with PCR, Western blot, SDS-page, high-pressure liquid chromatography; • 2-years internship (October 2012 - October 2014) at the Department of Neurosurgery, (Le Scotte Hospital, University of Siena, Prof. Giuseppe Oliveri), first approach to neurosurgical techniques and examination of a surgery candidate;
• Training experience	

- 1-years internship (October 2014 - July 2015) at the Si-BIN lab (Siena Brain Investigation and Neuromodulation laboratory, Prof. Simone Rossi and Dr. Emiliano Santarnecchi; Department of Neurology, Prof. Alessandro Rossi, Le Scotte Hospital, University of Siena): testing the influence of electric current and magnetic stimulation (tDCS, tACS, tRNS, TMS) on components of intelligence (e.g. working memory, processing speed, insight, creativity) through behavioral tests and neurophysiological techniques (fMRI: functional magnetic resonance imaging, EEG: electroencephalography), to enhance them and to reveal their neurophysiological and biological correlates;

- General English Course (6 July 2015 – 19 July 2015) in **Central Language School of Cambridge** (UK), (King's college's scholarship);

• Qualification
(23 July 2015)

Bachelor of Medicine and Bachelor of Surgery (MD) with a final score of 110/100 with merit (exams weighted average score: 29,8/30).

• Name and type of education institute

July 2015 – October 2016

Internship at the **Si-BIN lab**: coordinator of the Si-BIN lab experiments. In detail, developer of protocols, recruiter of participants, executor of the fMRI scanning and stimulations for:

(i) multifocal tDCS on healthy subject during fMRI scan to obtain a network modulation;
(ii) cortico-cortical Paired Associative Stimulation (ccPAS) to modulate functional connectivity and fluid intelligence on healthy subjects (assessed by fMRI analysis and behavioral tests);
(iii) video-game training experiment of one month with 1-year follow-up (fMRI and behavioral tests) on healthy subjects;
(iv) neurobiological correlates of top-level karate performers assessed with fMRI, cognitive and motor tests
(v) multifocal tDCS on patients with brain cancers to obtain tumor perfusion reduction.

November 2015 – January 2016:

Training for Italian License to Medical Practice: internships in the Department of Surgery, of Internal Medicine (Le Scotte Hospital, Siena) and with a general practitioner (Doctor Liliana Gradi, Neurophysiologist, Siena).

• Qualification

Italian License to Medical Practice (February, 2016)

• Name and type of education institute

November 2016 – November 2020

Radiology resident (University Hospital of Parma, Italy; Prof. Nicola Sverzellati) and **researcher** for the **Si-BIN lab** (Le Scotte Hospital, University of Siena, Italy, Prof. Simone Rossi, Dr. Emiliano Santarnecchi) with a specific focus on **Neuroradiology** (specifically on Neuro-oncology).

January 2019 – December 2019

Post-doctoral research fellow at **Berenson-Allen Center for Noninvasive Brain Stimulation,** Beth Israel Deaconess Medical Center, **Harvard Medical School** (Prof. Emiliano Santarnecchi, Boston, USA) to explore the neuroradiological correlates of Alzheimer's disease patients undergoing innovative therapeutic protocols, as well as to explore new imaging biomarkers and correlates for Dementia.

May 2019 – December 2019
Collaborator for the **Image Guided Neurosurgery Laboratory,** Brigham and Women's Hospital, **Harvard Medical School** (Prof. Alexandra Golby, Boston, USA) to explore functional connectivity alterations in glioma patients to predict survival.

• Qualification

Specialist in Radiology, 50/50 cum laude (November 2nd, 2020), University of Parma, Italy.

February 2021 – September 2021
Neuroradiologist at **IRCSS San Raffaele** (Milan, Italy; Prof. Andrea Falini, Prof Antonella Castellano, Vita-Salute San Raffaele University) with neurooncological clinical and research focus

November 2020 – in course
PhD student in **Neuroscience** at University of Florence (Italy; supervisor Prof. Simone Rossi, Le Scotte Hospital, University of Siena) to promote the understanding of functional connectivity alteration in brain tumor patients
Completed the first official "**Imaging Artificial Intelligence Certificate Program**" sponsored by **RSNA** (Radiological Society of North America);

Collaborator for the **Gordon Center for Medical Imaging at Massachusetts General Hospital (MGH) - Harvard Medical School (HMS)** to develop new imaging biomarkers and predictors for neuro-oncological patients

November 2021 – in course
Neuroradiologist at **Azienda Ospedaliero Universitaria di Modena** (Modena, Italy; Dr. Stefano Vallone) with a specific neuro-oncological clinical focus: implementation in the clinical practice of a multi-parameters perfusion protocol by optimizing the T1 Perfusion Weighted Imaging sequence (DCE- dynamic contrast-enhanced perfusion) to precociously differentiate radionecrosis/pseudoprogression from true tumor progression in patients with glioma and metastasis that underwent radiotherapy.

PERSONAL SKILLS

MOTHER TONGUE **ITALIAN**

OTHER LANGUAGE(S)

ENGLISH: PET (B1), FCE (B2), GENERAL ENGLISH COURSE

FRENCH: DELF CERTIFICATE (A2)

COMMUNICATION SKILLS

Consolidated communication skills gained through my experience as catechist in my native church (San Pietro ad Mensulas, Sinalunga, Siena) and matured by the medical training program in the hospital

ORGANIZATIONAL / MANAGERIAL SKILLS

Coordinator of (i) a multi-centric scientific study at Si-BIN lab of Siena in collaboration with the Faculty of Medicine, Harvard University (Boston, MA, USA), University of South California (Los Angeles, CA, USA) and University of Milano Bicocca (Milano, Italy) exploring the modulation of insight process by means tACS and tRNS, (ii) coordinator of all the experiments conducted from July 2015 to October 2016 at Si-BIN lab (Siena, Italy)

	Organizer and volunteer at religious national conferences in the Holy Convent of Assisi (PG, Italy)
JOB-RELATED SKILLS	Execution of MRI exams (functional imaging, perfusion imaging, anatomical scans) and transcranial magnetic and electrical stimulation studies (tACS, tRNS, tDCS, TMS techniques)
	First aid service (assistance in ambulance, course organized by the Arciconfraternita di Misericordia di Siena - first aid volunteering no-profit organization)
	European Computer Driving Licence (ECDL)
OTHER SKILLS	Playing piano for 7 years, volleyball for 10 years, occasionally tennis player

PRIZE

1) July 6, 2015: **King's college's scholarship** to attend an English course, promoted by University of Siena;

2) September 29, 2015: **Look to the future grant**, promoted by Merck & Co., (pharmaceutical company);

3) November 1, 2015: **GIMBE For Young scholarship** to attend an "Evidence-based Medical Practice" course;

4) February 4, 2016: **XXV SIPF Prize for the best Italian MD** thesis on psychophysiology and cognitive neuroscience: "The neurobiological basis of intrinsic cognitive processes and their modulation by new non-invasive electro-physiological techniques";

5) October 4, 2016: **University of Siena Grant** "Ideation, design and development of application exploiting the WEARHAP wearable haptic device" (incompatible with the subsequent medical residency);

6) September 21, 2020: **RSNA Trainee Research Prize** for the research project "Functional Connectivity Profile of Solid Tumor Predicts Overall Survival in Patients with Gliomas" at the 106th Scientific assembly and Annual Meeting of the Radiological Society of North America (RSNA).

7) November 27, 2020: winner of the **2-Years Fellowship for Abroad promoted by AIRC - Foundation for cancer research** to deepen the understanding of functional connectivity in gliomas and predict patients' survival, not pursued for private reasons.

PRESENTATIONS

- April 9, 2016, oral presentation: "**Analysis of functional connectivity of an epileptic patient with Double Cortex Syndrome**", Sprugnoli G., Santarnecchi E., Marino D., Pucci B., Vatti G. IV Meeting SNO Toscana 2016 (Society of Hospital Neurologists, Neurosurgeons and Neuroradiologists, Pontedera PI, Italy);

- June 8, 2016, oral presentation: "**Resting-State MRI applications**" for an advanced updating medical course (Multimodal Magnetic Resonance in Neuroradiology. Studying the brain from physiopathology to the functions, Le Scotte Hospital, Siena, Italy);

- October 27, 2016, symposium presentation: "**Oscillatory Neuromodulation of Insight and Creativity brain processes**" XXIV National Congress of the Italian Society of Psychophysiology (SIPF, Milan, Italy);

- March 5-8, 2017, poster presentation: "**Going beyond the Eureka moment: enhancement of insightful solutions by means of tACS and tRNS**", Sprugnoli G., Liew S. L., Bricolo E., Costantini G., Salvi C., Musaeus C. S., Rossi S., Rossi A., Pascual-Leone A., Santarnecchi E. 2nd International Brain Stimulation Conference (Barcelona, Spain);

- December 1 - 6, 2019, oral presentation: "**Reduction of Intratumoral Perfusion in Brain Cancers Patients by Noninvasive Electrical Stimulation**", Sprugnoli G, Monti L, Lippa L, Neri F, Mencarelli L, Ruffini G, Salvador R, Oliveri G, Batani B, Momi D, Cerase A, Pascual-Leone A, Rossi A, Rossi S, Santarnecchi E., 105th Radiological Society of North America (RSNA) Scientific Assembly and Annual Meeting (Chicago, IL, US);

- November 29 – December 5 2020, (online) oral presentation "**Functional Connectivity Profile of Solid Tumor Predicts Overall Survival in Patients with Gliomas**", Sprugnoli G, Rigolo L; Faria MJ, Juvekar PR, Sverzellati N, Golby AJ, Santarnecchi E, 106th Radiological Society of North America (RSNA) Scientific Assembly and Annual Meeting;

- November 27, 2020, (online) oral presentation: "**tDCS and brain tumors**" for the symposium "Non Invasive Brain Stimulation: not only *electrical* effects", XXVIII National Congress of the Italian Society of Psychophysiology (SIPF);

- March 27, 2022, (online) oral presentation: "**Gliomas' functional connectivity and its relevance to patients' survival**", Sprugnoli G, Rigolo L, Faria MJ, Juvekar PR, Sverzellati N, Golby AJ, Santarnecchi E., 6th Quadrennial Meeting of the World Federation of Neuro-oncology Societies (WFNOS 2022);

- June 6, 2022, invited (online) talk for the Neurowebinars series: "**I tumori cerebrali nel 2022: nuove prospettive diagnostico-terapeutiche?**";

- September 4–8, 2022, invited symposium presentation at the 32nd International Congress of Clinical Neurophysiology (ICCN, Geneve, CH) on "**Impact of tES on brain perfusion in pathological conditions**";

- December 5-6, 2022, invited presentation at the VI National Congress of Functional Neuroradiology – Associazione Italiana di Neuroradiologia Diagnostica e Interventistica (AINR, Padova, IT) on "**Presurgical functional mapping with rs-fMRI in brain tumors**";

- February 2-4, 2023, invited talk at the Third Edition of the Intraoperative Neurophysiology in Neurosurgery EANS Symposium (Verona, IT) on "**Newly discovered neuron-to-glioma communication: Rationale, challenges and opportunities for non-invasive brain stimulation**".

PUBLICATIONS

1. **Neural Correlates of Eureka Moment**. Sprugnoli G, Rossi S, Emmendorfer A, Rossi A, Liew SL, Tatti E, di Lorenzo G, Pascual-Leone A, Santarnecchi E. Intelligence, 2017, 62, 99-118. doi: 10.1016/j.intell.2017.03.004

2. **Brain functional connectivity correlates of coping styles**. Santarnecchi E, Sprugnoli G, Tatti E, Mencarelli L, Neri F, Momi D, Di Lorenzo G, Pascual-Leone A, Rossi S, Rossi A. Cogn Affect Behav Neurosci. 2018 Mar 23. doi: 10.3758/s13415-018-0583-7

3. **Age of Insomnia Onset Correlates with a Reversal of Default Mode Network and Supplementary Motor Cortex Connectivity**. Santarnecchi E, Del Bianco C, Sicilia I, Momi D, Di Lorenzo G, Ferrone S, Sprugnoli G, Rossi S, Rossi A. Neural Plasticity, vol. 2018, Article ID 3678534, 2018. doi:10.1155/2018/3678534

4. **Functional Connectivity and Genetic Profile of a "Double-Cortex"-Like Malformation**. Sprugnoli G, Vatti G, Rossi S, Cerase A, Renieri A, Mencarelli MA, Zara F, Rossi A, Santarnecchi E. Front Integr Neurosci. 2018 Jun 12;12:22. doi: 10.3389/fnint.2018.00022. eCollection 2018

5. **Acute and Long-Lasting Cortical Thickness Changes Following Intensive First-Person Action Videogame Practice**. Momi D, Smeralda C, Sprugnoli G, Ferrone S, Rossi S, Rossi A, Di Lorenzo G, Santarnecchi E. Behav Brain Res. 2018 Jun 23. doi:10.1016/j.bbr.2018.06.013

6. **Modulation of network-to-network connectivity via spike-timing-dependent noninvasive brain stimulation**. Santarnecchi E, Momi D, Sprugnoli G, Neri F, Pascual-Leone A, Rossi A, Rossi S. Hum Brain Mapp. 2018 Aug 16. doi: 10.1002/hbm.24329.

7. **Thalamic morphometric changes induced by First-Person-Action videogame training.** Momi D, Smeralda C, Sprugnoli G, Neri F, Rossi S, Rossi A, Di Lorenzo G, Santarnecchi E. Eur J Neurosci. 2018 Dec 16. doi: 10.1111/ejn.14272

8. **Gamma tACS over the temporal lobe increases the occurrence of *Eureka!* moments**. Santarnecchi E*, Sprugnoli G*, Bricolo E, Costantini G, Liew SL, Musaeus SC, Salvi C, Pascual-Leone A, Rossi A, Rossi S. Sci Rep, 2019, Apr 8;9(1):5778. doi: 10.1038/s41598-019-42192-z

9. **Peculiarities of Functional Connectivity—including Cross-Modal Patterns—in Professional Karate Athletes: Correlations with Cognitive and Motor Performances**. Berti B, Momi D, Sprugnoli G, et al, Neural Plasticity, 2019. doi: 10.1155/2019/6807978

10. **Reduction of intratumoral brain perfusion by noninvasive transcranial electrical stimulation**. Sprugnoli G*, Monti L*, Lippa L, Neri F, Mencarelli L, Ruffini G, Salvador R, Oliveri G, Batani B, Momi D, Cerase A, Pascual-Leone A, Rossi A, Rossi S, Santarnecchi E. Science Advances, 5, eaau9309 (2019). doi: 10.1126/sciadv.aau9309

11. **Cognitive Enhancement via Network-Targeted Cortico-Cortical Associative Brain Stimulation**. Momi D, Neri F, Coiro G, Smeralda C, Veniero D, Sprugnoli G, Rossi A, Pascual-Leone A, Rossi S, Santarnecchi E. *Cerebral Cortex*, bhz182, https://doi.org/10.1093/cercor/bhz182

12. **A Novel tDCS Sham Approach Based on Model-Driven Controlled Shunting.** Neri F, Mencarelli L, Menardi A, Giovannelli F, Rossi S, Sprugnoli G, Rossi A, Pascual-Leone A, Salvador R, Ruffini G, Santarnecchi E. Brain Stimulation, https://doi.org/10.1016/j.brs.2019.11.004

13. **Microgravity and Cosmic Radiations During Space Exploration as a Window Into Neurodegeneration on Earth.** Sprugnoli G, Cagle YD, Santarnecchi E. JAMA Neurol. Published online November 25, 2019. https://doi.org/10.1001/jamaneurol.2019.4003

14. **Improving Choroid Plexus Segmentation in the Healthy and Diseased Brain: Relevance for Tau-PET Imaging in Dementia**. Tadayon E, Moret B, Sprugnoli G, Monti L, Pascual-Leone A, Santarnecchi E; Alzheimer's Disease Neuroimaging Initiative. J Alzheimers Dis. 2020 Mar 2. doi: 10.3233/JAD-190706

15. **Impact of network-targeted multichannel transcranial direct current stimulation on intrinsic and network-to-network functional connectivity**. Mencarelli L, Menardi A, Neri F, Monti L, Ruffini G, Salvador R, Pascual-Leone A, Momi D, Sprugnoli G, Rossi A, Rossi S, Santarnecchi E; J Neurosci Res. 2020 Oct;98(10):1843-1856. doi: 10.1002/jnr.24690

16. **Noninvasive Brain Stimulation & Space Exploration: Opportunities and Challenges**. Romanella S, Sprugnoli G, Ruffini G, Seyedmadani K, Rossi S, Santarnecchi E. Neurosci Biobehav Rev. 2020 Sep 13:S0149-7634(20)30561-3. doi: 10.1016/j.neubiorev.2020.09.005

17. **Functional connectivity changes and symptoms improvement after personalized, double-daily dosing, repetitive Transcranial Magnetic Stimulation in Obsessive-Compulsive Disorder: a pilot study.** Mantovani A, Neri F, D'Urso G, Mencarelli L, Tatti E, Momi D, Menardi A, Sprugnoli G, Santarnecchi E, Rossi S. Journal of Psychiatric Research. 2020, 2020 Oct 29:S0022-3956(20)31033-5. doi: 10.1016/j.jpsychires.2020.10.030

18. **Newly discovered neuron-to-glioma communication: new noninvasive therapeutic opportunities on the horizon?** Sprugnoli G, Golby AJ, Santarnecchi E. Neurooncol Adv. 2021 Feb 4;3(1):vdab018. doi: 10.1093/noajnl/vdab018. eCollection 2021 Jan-Dec

19. **Enhancement of semantic integration reasoning by tRNS**. Sprugnoli G, Rossi S, Liew SL, Bricolo E, Costantini G, Salvi C, Golby AJ, Musaeus CS, Pascual-Leone A, Rossi A, Santarnecchi E. Cogn Affect Behav Neurosci. 2021 Apr 2. doi: 10.3758/s13415-021-00885-x

20. **Personalized Adaptive Training Improves Performance at a Professional First-Person Shooter Action Videogame.** Neri F, Smeralda CL, Momi D, Sprugnoli G, Menardi A, Ferrone S, Rossi S, Rossi A, Di Lorenzo G, Santarnecchi E.Front Psychol. 2021 Jun 10;12:598410. doi: 10.3389/fpsyg.2021.598410. eCollection 2021.PMID: 34177682

21. **Gamma-Induction in FrontoTemporal Dementia (GIFTeD) Randomized Placebo-controlled Trial: Rationale, Non-invasive Brain Stimulation Protocol and Study Design**. Assogna M*, Sprugnoli G*, Press D, Dickerson B, Macone J, Bonnì S, Borghi I, Connor A, Hoffman M, Grover N, Wong B, Shen C, Martorana A, O'Reilly M, Ruffini G, El Fakhri G, Koch G, Santarnecchi E. Alzheimers Dement (N Y), 2022 Feb 3;7(1):e12219. doi: 10.1002/trc2.12219. eCollection 2021. PMID: 35141396

22. **Personalised, image-guided, noninvasive brain stimulation in gliomas: Rationale, challenges and opportunities**. Sprugnoli G, Rossi S, Rotenberg A, Alvaro Pascual-Leone A, El-Fakhri G, Alexandra J. Golby AJ, Santarnecchi E. EBioMedicine, 2021 Aug 11;70:103514. doi: 10.1016/j.ebiom.2021.103514

23. **Thalamic altered spontaneous activity and connectivity in obstructive sleep apnea syndrome**. Santarnecchi E, Sprugnoli G, Sicilia I, Dukart J, Neri F, Romanella SM, Cerase A, Vatti G, Rocchi

R, Rossi A. J Neuroimaging. 2022 Mar;32(2):314-327. doi: 10.1111/jon.12952. Epub 2021 Dec 28. PMID: 34964182

24. **Impact of multisession 40Hz tACS on hippocampal perfusion in patients with Alzheimer's disease.** Sprugnoli G, Munsch F, Cappon D, Paciorek R, Macone J, Connor A, El Fakhri G, Salvador R, Ruffini G, Donohoe K, Shafi MM, Press D, Alsop DC, Pascual Leone A, Santarnecchi E.Alzheimers Res Ther. 2021 Dec 20;13(1):203. doi: 10.1186/s13195-021-00922-4. PMID: 34930421

25. **Impact of 40 Hz Transcranial Alternating Current Stimulation on Cerebral Tau Burden in Patients with Alzheimer's Disease: A Case Series.** Dhaynaut M*, Sprugnoli G*, Cappon D, Macone J, Sanchez JS, Normandin MD, Guehl NJ, Koch G, Paciorek R, Connor A, Press D, Johnson K, Pascual-Leone A, El Fakhri G, Santarnecchi E. J Alzheimers Dis. 2022;85(4):1667-1676. doi: 10.3233/JAD-215072. PMID: 34958021

26. **Local and distributed fMRI changes induced by 40Hz gamma tACS of the bilateral dorsolateral prefrontal cortex: a pilot study**. Mencarelli L, Monti L, Romanella S, Neri F, Koch G, Salvador R, Ruffini G, Sprugnoli G, Rossi S, Santarnecchi E. Neural Plasticity. 2022. Jul 16;2022:6197505. doi: 10.1155/2022/6197505. eCollection 2022. PMID: 35880231.

27. **Tumor BOLD connectivity profile correlates with glioma patients' survival**. Sprugnoli G, Rigolo L, Faria M, Juvekar P, Tie Y, Rossi S, Sverzellati N, Golby AJ*, Santarnecchi E*. Neurooncol Adv. 2022 Sep 25;4(1):vdac153. doi: 10.1093/noajnl/vdac153. eCollection 2022 Jan-Dec.

28. **Optimizing transcranial magnetic stimulation for spaceflight applications**. Romanella SM, Mencarelli L, Seyedmadani K, Jillings S, Tomilovskaya E, Rukavishnikov I, Sprugnoli G, Rossi S, Wuyts FL, Santarencchi E. npj Microgravity, under press. doi.org/10.1038/s41526-023-00249-4.

Note = "*" identifies equal contribution.