

**CURRICULUM VITAE ET STUDIORUM**  
*Dr. Pierpaolo Busan*

Venice, November 19<sup>th</sup> 2019

**Family name:** Busan

**First name:** Pierpaolo

**Birth date:**  
August 30<sup>th</sup>, 1980

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**Scholastic career:**

*2011-2013*  
University of Trieste, Italy  
Specialization Degree in Clinical Neuropsychology (December 20<sup>th</sup> 2013)

*2006-2009*  
University of Trieste, Italy  
PhD in Neuroscience (March 27<sup>th</sup> 2009).  
Main research project: “Transcranial Magnetic Stimulation in planning and execution of reaching movements”.

*1999-2004*  
University of Trieste, Italy  
Master Degree in Psychology (curriculum in psychobiology; November 22<sup>nd</sup> 2004) 110/110 cum laude.

Number 1135 in the Register of the Psychologists, Friuli-Venezia Giulia, since 7/29/2008;  
registered as a Psychotherapist since 4/28/2014.

**Italian National Scientific Habilitation (Abilitazione Scientifica Nazionale):**

Italian National Scientific Habilitation in the following scientific section: “11/E1 Psicologia Generale, Psicobiologia e Psicomatria (Professore di Seconda Fascia)”; the title is valid from November 5<sup>th</sup> 2018 to November 5<sup>th</sup> 2024.

**Work experience:**

*September 2015-Today*  
Fellowship funded by IRCCS Fondazione Ospedale San Camillo, Venice, Italy (“Contratto di collaborazione coordinata e continuativa”). Main project (Principal Investigator): Transcranial Magnetic Stimulation (TMS), EEG and Magnetoencephalography in the study of the

neurophysiology of persistent developmental stuttering; neuropsychological testing and diagnosis in cognitive (e.g. memory) disorders.

*June 2014-May 2015*

Post-doc fellowship (“Assegno di ricerca”) funded by University of Trieste, Department of Life Sciences. Main project: Transcranial Magnetic Stimulation (TMS), EEG and their combination in the study of the neurophysiology of developmental stuttering toward new rehabilitation solutions.

*January 2014-May 2014*

Visiting researcher at University of Trieste, Department of Life Sciences. Main project: Combination of Transcranial Magnetic Stimulation (TMS) and EEG in the study of brain networks in healthy and pathological conditions; TMS in Parkinson’s Disease; Brain Computer Interfaces and Neurofeedback in Parkinson’s Disease; clinical neuropsychology.

*January 2012-December 2013*

Post-doc fellowship (“Assegno di ricerca”) funded by University of Trieste, Department of Life Sciences. Main project: Combination of Transcranial Magnetic Stimulation (TMS) and EEG in the study of brain networks in healthy and pathological conditions; TMS in Parkinson’s Disease; Brain Computer Interfaces and Neurofeedback in Parkinson’s Disease; clinical neuropsychology.

*January 2011-January 2012*

Fellowship (“Tutorship”) funded by Rehabilitation Master Degree, University of Trieste. Main project: TMS in Parkinson’s Disease.

*October 2009-September 2010*

Fellowship (“Incarico professionale neuropsicologo”) funded by “Azienda Ospedaliero-Universitaria di Trieste, S.C. Clinica Neurologica e S.S. Neurofisiologia Clinica” (Department of Medical, Surgical and Health Sciences, University of Trieste, Trieste, Italy). Main project: Combination of TMS and EEG in the study of brain networks in healthy and pathological conditions; clinical neuropsychology.

*March 2009-September 2009*

Fellowship (“Borsa di studio”) at D.S.B.T.A. (Dipartimento di Scienze Biomediche e Terapie Avanzate), Section of Human Physiology, University of Ferrara, Italy. Main project: TMS in the study of the speech/language systems; TMS in stroke; TMS and the mirror neurons system.

*December 2005-March 2009*

PhD Student in Neuroscience at the B.R.A.I.N. Centre for Neuroscience, Department of Life Sciences, University of Trieste. Main project: TMS in the planning and execution of reaching movements.

*April 2006-July 2006*

Apprenticeship at D.S.B.T.A. (Dipartimento di Scienze Biomediche e Terapie Avanzate), Section of Human Physiology, University of Ferrara, Italy. Main project: TMS in the study of the speech/language systems; TMS in stroke; TMS and the mirror neurons system.

## **Teaching experience:**

(All evaluations are available at:  
<https://valmon.disia.unifi.it/sisvalidat/units/index.php>)

### *March 2019-June 2019*

Teaching assignment at the Department of Life Sciences, University of Trieste, Specialization Degree in Neuropsychology (A.A. 2018/2019, 15 hours): “Functional Neuroanatomy” (scientific sector: MED/26, evaluation not available);

### *September 2018-February 2019*

Teaching assignment at the Department of Life Sciences, University of Trieste, International Master Degree in Neuroscience (A.A. 2018/2019, 5 cfu): “Neurofunctional Techniques” (scientific sector: FIS/07, mean evaluation of the course by students: 8.7/10);

### *March 2018-June 2018*

Teaching assignment at the Department of Life Sciences, University of Trieste, Master Degree in Psychology (A.A. 2017/2018, 6 cfu): “Advanced Neurophysiology” (scientific sector: BIO/09, mean evaluation of the course by students: 8.7/10);

### *October 2017-January 2018*

Teaching assignment at the Department of Life Sciences, University of Trieste, Specialization Degree in Neuropsychology (A.A. 2016/2017, 15 hours): “Functional Neuroanatomy” (scientific sector: MED/26, evaluation not available);

### *March 2017-June 2017*

Teaching assignment at the Department of Life Sciences, University of Trieste, Master Degree in Psychology (A.A. 2016/2017, 6 cfu): “Advanced Neurophysiology” (scientific sector: BIO/09, mean evaluation of the course by students: 8.8/10);

### *March 2016-June 2016*

Teaching assignment at the Department of Life Sciences, University of Trieste, Master Degree in Psychology (A.A. 2015/2016, 6 cfu): “Advanced Neurophysiology” (scientific sector: BIO/09, mean evaluation of the course by students: 8.7/10);

### *January 2016*

Teaching assignment at the Department of Life Sciences, University of Trieste, Specialization Degree in Neuropsychology (A.A. 2014/2015, 15 hours): “Functional Neuroanatomy” (scientific sector: MED/26, evaluation not available);

### *March 2015-June 2015*

Teaching assignment at the Department of Life Sciences, University of Trieste, Master Degree in Psychology (A.A. 2014/2015, 6 cfu): “Advanced Neurophysiology” (scientific sector: BIO/09, mean evaluation of the course by students: 8.4/10);

### *September 2014-January 2015*

Teaching assignment at the Department of Life Sciences, University of Trieste, Bachelor Degree in Psychology (A.A. 2014/2015, 8 cfu): “Neurophysiology” (scientific sector: BIO/09, mean evaluation of the course by students: 8.2/10);

*May 2014-June 2014*

Teaching assignment at the Department of Life Sciences, University of Trieste, Master Degree in Psychology (A.A. 2013/2014, 30 hours): complementary activity for the course “Advanced Neurophysiology” (scientific sector: BIO/09, evaluation not available).

*January 2011-January 2012*

Tutorial activity at the Master Degree in Rehabilitation Sciences, Department of Medical, Surgical and Health Sciences, University of Trieste.

*2007-2019*

Supervisor of n. 5 Master Degree Thesis; co-supervisor of n. 11 Master Degree Thesis

*November 2017-Today*

Collaboration in the supervision of the PhD project entitled: “The neurophysiology of persistent developmental stuttering in adulthood” (PhD Student: Giovanni Del Ben, Supervisor: Prof. Paolo Manganotti), PhD Program in Neuroscience and Cognitive Sciences, Department of Life Sciences, University of Trieste.

### **Experience in Clinical Neuropsychology:**

*February 2014–April 2018*

Visiting Psychologist at the Neurology Section of the University Hospital of Trieste (Neuropsychology testing and assessment).

*June 2013-December 2013*

Apprenticeship in Neuropsychology (Specialization Degree in Neuropsychology, University of Trieste) at “Distretto 1 dell’Azienda per i Servizi Sanitari n.1 – Triestina, Centro Distrettuale per la Diagnosi delle Demenze”.

*April 2011- December 2013*

Training in Neuropsychology at the Neurology Section of the University Hospital of Trieste (Specialization Degree in Neuropsychology, University of Trieste; Neuropsychology testing and assessment).

*May 2012-December 2012*

Training in Neuropsychology at the Rehabilitation Section of the University Hospital of Trieste (Specialization Degree in Neuropsychology, University of Trieste; Neuropsychology testing and assessment, cognitive rehabilitation).

*October 2009-September 2010*

Neuropsychologist at the Neurology Section of the University Hospital of Trieste (Neuropsychology testing and assessment).

*2005*

Six months-training in Neuropsychology at the Rehabilitation Section of the University Hospital of Trieste (Neuropsychology testing and assessment);

Six months training in Neuropsychology at the Italian Association for Multiple Sclerosis, Section of Trieste.

### **Fundings for research projects**

Funding from Beneficentia Stiftung, Vaduz (Liechtenstein) for the project “The neurophysiology of developmental stuttering: toward new rehabilitative solutions”.

Funding from Italian Ministry of Health “Bando di Ricerca Finalizzata 2018 (Sezione Giovani Ricercatori)”: Principal Investigator for the project “The treatment of persistent developmental stuttering: shaping of motor neural functioning to improve fluency”. Project Code: GR-2018-12366027.

### **Funding Requests**

Collaborator in the project “Probing the functional connectome features of (un)consciousness: a new neuroimaging tool to improve clinical interventions in patients with disorders of consciousness”. “Bando di Ricerca Finalizzata 2019 (Sezione Giovani Ricercatori)”, Italian Ministry of Health.

### **Previous funding requests (not funded):**

*2010-2016*

- “Bando di Ricerca Finalizzata (Sezione Giovani Ricercatori) del Ministero della Salute”: n. 4 applications as Principal Investigator;
- “Scientific Independence in Research – SIR”: n. 1 application as Principal Investigator;
- “Bando Futuro in Ricerca – FIRB: n. 1 application as responsible of local unit;
- “Finanziamenti di Ateneo – Bando FRA, Università di Trieste”: n. 1 application as part of the research unit;

### **Editorial roles and editorial tasks**

*2011-Today*

Reviewer for International Journals such as *Cortex*, *Cerebral Cortex*, *Movement Disorders*, *Frontiers*, *PLoS ONE*, *Archives Italiennes de Biologie*, and *Journal of Cognitive Neuroscience*.

*2018-Today*

Guest Editor of the Research Topic “*The neurophysiology of developmental stuttering: unravelling the mysteries of fluency*”, in collaboration with Prof. Martin Sommer (Göttingen, Germany), Dott. Nicole Neef (Leipzig, Germany), Dott. Maja Rogic (Split, Croatia), and Prof. Piero Paolo Battaglini (Trieste, Italia), hosted by *Frontiers in Human Neuroscience*, *Frontiers in Integrative Neuroscience*, *Frontiers in Psychology*, and *Frontiers in Physiology*.

### **Membership of Scientific Societies**

*2009-Today*

Member of the Italian Society of Neuroscience (SINS), and Federation of European Neuroscience Societies (FENS);

*2010-2018*

Member of the Italian Society of Clinical Neurophysiology (SINC).

**Publication list**  
(papers “*in extenso*”)

De Bonis P, **Busan P**, D’Ausilio A, Labanti S, Cavallo MA, Fadiga L (2019). Developmental stuttering disappearance after iatrogenic lesion of the facial nerve. *Journal of Neurosurgical Sciences*, *in press*. ISSN 1827-1855. Edizioni Minerva Medica. **Citation Score (Scopus): NA; IF: 1.9;**

**Busan P**, Del Ben G, Russo LR, Bernardini S, Ntarelli G, Arcara G, Manganotti P, Battaglini PP (2019). Stuttering as a matter of delay in neural activation: a combined TMS/EEG study. *Clinical Neurophysiology*, vol. 130, pp. 61-76. ISSN: 1388-2457. January 2019, Elsevier eds. **Citation score (Scopus): 1; IF: 3.6;**

Dinoto A, **Busan P**, Formaggio E, Bertolotti C, Menichelli A, Stokelj D, Manganotti P (2018). Stuttering-like hesitation in speech during acute/post acute phase of immune-mediated encephalitis. *Journal of Fluency Disorders*, vol. 58, pp.70-76. ISSN: 0094-730X. December 2018, Elsevier eds. **Citation score (Scopus): 0; IF: 1.7;**

Casagrande A, Jarmolowska J, Turconi M, Fabris F, **Busan P**, Battaglini PP. PolyMorph: increasing P300 spelling efficiency by selection matrix polymorphism and sentence-based predictions. *International Journal of Human-Computer Interaction*, vol. 34, pp. 1085-1104. ISSN: 1044-7318 (Print), 1532-7590 (Online). December 2018, Taylor & Francis eds. **Citation score (Scopus): 0; IF: 1.3;**

Rakusa M, **Busan P**, Battaglini PP, Zidar J (2018). Separating the idea from the action: A sLORETA study. *Brain Topography*, vol. 31, pp. 228-241. ISSN: 0896-0267. March 2018, Springer Eds. **Citation score (Scopus): 1; IF: 2.7;**

**Busan P**, Battaglini PP, Sommer M (2017). Transcranial magnetic stimulation in developmental stuttering: relations with previous neurophysiological research and future perspectives. *Clinical Neurophysiology*, vol. 128, pp. 952-964. ISSN: 1388-2457. April 2017, Elsevier eds. **Citation score (Scopus): 3; IF: 3.6;**

**Busan P**, Del Ben G, Bernardini S, Ntarelli G, Bencich M, Monti F, Manganotti P, Battaglini PP (2016). Altered modulation of silent period in tongue motor cortex of persistent developmental stuttering in relation to stuttering severity. *PLoS ONE*, vol. 11, pp. e0163959. ISSN: 1932-6203. October 2016, PLoS. **Citation score (Scopus): 4; IF: 2.8;**

**Busan P**, D’Ausilio A, Borelli M, Monti F, Pelamatti G, Pizzolato G, Fadiga L (2013) Motor excitability evaluation in developmental stuttering: a transcranial magnetic stimulation study. *Cortex*, vol. 49, pp. 781-792. ISSN: 0010-9452. March 2013, Elsevier eds. **Citation score (Scopus): 13; IF: 4.9;**

Zanon M, Battaglini PP, Jarmolowska J, Pizzolato G, **Busan P** (2013) Long-range neural activity evoked by premotor cortex stimulation: a TMS/EEG co-registration study. *Frontiers in Human Neuroscience*, vol. 7, p. 803. ISSN: 1662-5161. November 2013, Frontiers Media S.A. **Citation score (Scopus): 12; IF: 2.9;**

Jarmolowska J, Turconi MM, **Busan P**, Mei J, Battaglini PP (2013) A multitemenu system based on the P300 component as a time saving procedure for communication with a brain-computer interface. *Frontiers in Neuroscience*, vol. 7, p. 39. ISSN: 1662-453X. March 2013, Frontiers Media S.A. **Citation score (Scopus): 2; IF: 3.9;**

**Busan P**, Zanon M, Vinciati F, Monti F, Pizzolato G, Battaglini PP (2012) Transcranial magnetic stimulation and preparation of visually-guided reaching movements. *Frontiers in Neuroengineering*, vol. 5, p. 18. ISSN: 1662-6443. August 2012, Frontiers Media S.A. **Citation score (Scopus): 6; IF: NA;**

Tavano A, **Busan P**, Borelli M, Pelamatti G (2011) Risperidone reduces tic-like motor behaviors and linguistic dysfluencies in severe persistent developmental stuttering. *Journal of Clinical Psychopharmacology*, vol. 31, pp. 131-134. ISSN: 0271-0749. February 2011, Lippincott Williams & Wilkins eds. **Citation score (Scopus): 9; IF: 3.1;**

D'Ausilio A, Jarmolowska J, **Busan P**, Bufalari I, Craighero L (2011) Tongue corticospinal modulation during attended verbal stimuli: Priming and coarticulation effects. *Neuropsychologia*, vol. 49, pp. 3670-3676. ISSN: 0028-3932. November 2011, Elsevier eds. **Citation score (Scopus): 23; IF: 2.9;**

D'Ausilio A, Bufalari I, Salmas P, **Busan P**, Fadiga L (2011) Vocal pitch discrimination in the motor system. *Brain and Language*, vol. 118, pp. 9-14. ISSN: 0093-934X. July 2011, Elsevier eds. **Citation score (Scopus): 21; IF: 2.9;**

Zanon M, **Busan P**, Monti F, Pizzolato G, Battaglini PP (2010) Cortical connections between dorsal and ventral visual streams in humans: evidence by TMS/EEG co-registration. *Brain Topography*, vol. 22, pp. 307-317. ISSN: 0896-0267. January 2010, Springer eds. **Citation score (Scopus): 36; IF: 2.7;**

**Busan P**, Barbera C, Semenic M, Monti F, Pizzolato G, Pelamatti G, Battaglini PP (2009) Effect of Transcranial Magnetic Stimulation (TMS) on parietal and premotor cortex during planning of reaching movements. *PLoS ONE*, vol. 4, p. e4621. ISSN: 1932-6203. February 2009, PLoS. **Citation score (Scopus): 30; IF: 2.8;**

**Busan P**, Jarmolowska J, Semenic M, Monti F, Pelamatti G, Pizzolato G, Battaglini PP (2009) Involvement of ipsilateral parieto-occipital cortex in the planning of reaching movements: evidence by TMS. *Neuroscience Letters*, vol. 460, pp. 112–116. ISSN: 0304-3940. August 2009, Elsevier eds. **Citation score (Scopus): 5; IF: 2.2;**

**Busan P**, Monti F, Semenic M, Pizzolato G, Battaglini PP (2009) Parieto-occipital cortex and planning of reaching movements: a TMS study. *Behavioural Brain Research*, vol. 201, pp. 112-119. ISSN: 0166-4328. July 2009, Elsevier eds. **Citation score (Scopus): 13; IF: 3.2;**

**Busan P**, Battaglini PP, Borelli M, Evaristo P, Monti F, Pelamatti G (2009) Investigating the efficacy of paroxetine in developmental stuttering. *Clinical Neuropharmacology*, vol. 32, pp. 183-188. ISSN: 0362-5664. July/August 2009, Lippincott Williams & Wilkins eds. **Citation score (Scopus): 10; IF: 1.4;**

**Busan P**, Fabbro F, Grassi M, Tavano A, Pelamatti G (2008) Effetto del trattamento farmacologico nella balbuzie evolutiva: studio comportamentale di un caso singolo. *Giornale Italiano di Psicologia*, vol. 1, pp. 193-213. ISSN: 0390-5349. March 2008, Il Mulino Editore, Bologna. **Citation score (Scopus): NA; IF: 0.11.**

Total H-index (Scopus): 9;

Total citation score (Scopus): 18

### **Main publications of Congress Proceedings**

**Busan P**, Del Ben G, Formaggio E, Bernardini S, Natarelli G, Arcara G, Manganotti P, Battaglini PP. Neural dynamics in persistent developmental stuttering: a suggestion for innovative treatments? Proceedings of the 3rd International Conference on Stuttering (Rome, June 14<sup>th</sup>-16<sup>th</sup>, 2018), pp. 30-39; ISBN: 978-88-590-1846-99. Edizioni Centro Studi Erickson, Trento.

Del Ben G, Tantone A, Halaj L, Bernardini S, Natarelli G, Manganotti P, Battaglini PP, **Busan P**. Muscular interplay in persistent developmental stuttering: a Transcranial Magnetic Stimulation study. Proceedings of the 3rd International Conference on Stuttering (Rome, June 14<sup>th</sup>-16<sup>th</sup>, 2018), pp. 40-48; ISBN: 978-88-590-1846-99; Edizioni Centro Studi Erickson, Trento.

Del Ben G, **Busan P** (2017). The neural correlates of developmental stuttering: A brief overview of the literature. Collana Studi AISV 3, pp. 409-422. ISBN (digital edition): 978-88-97657-19-4. Officinaventuno Edizioni, Milano.

**Busan P**, Del Ben G, Russo R, Formaggio E, Monti F, Manganotti P, Battaglini PP (2016). Cortical reactivity and cortico-cortical interactions in Persistent Developmental Stuttering investigated by TMS/EEG co-registration. *Neuropsychological Trends*, vol. 20, p. 72; ISSN 1970-321X, November 2016; LED Edizioni Universitarie di Lettere Economia Diritto – Milano.

Rakusa M, **Busan P**, Battaglini PP, Koritnik B, Zidar J (2016). Wide prefrontal and sensory-motor network involvement in the preparation of the choice in comparison to the simple reaching. *European Journal of Neurology*, vol. 23, p. 276.; ISSN 1468-1331; Wiley.

**Busan P**, Del Ben G, Monti F, Bernardini S, Natarelli G, Battaglini PP (2015) Transcranial magnetic stimulation to evaluate tongue motor representations in adults with persistent developmental stuttering. Proceedings of 2nd International Conference on Stuttering, Rome, October 15<sup>th</sup>-17<sup>th</sup>, pp. 23-30, ISBN: 978-88-590-1130-9; Erickson.

Cucca A, Catalan M, Antonutti L, Mezzarobba S, **Busan P**, Koscica N (2015). Changes in motor-cortex excitability after different rehabilitation programs in PD patients with freezing of gait: neurocognitive rehabilitation with motor imagery vs treadmill training. *Movement Disorders*, vol. 30, Suppl. 1, p. 202. ISSN: 1531-8257, Wiley.

Jarmolowska J, **Busan P**, Bencich M, Gallina P, Battaglini PP, Dalla Barba G, Gerbino W, Volcic R, Fantoni C (2015) Visuomotor adaptation changes tactile discrimination: an ERP study. In: Bernardis, Paolo; Fantoni, Carlo; Gerbino, Walter. TSPC2015. Proceedings of the Trieste Symposium on Perception and Cognition, Trieste, November 13<sup>th</sup>, 2015; p. 61-62 (P23); ISBN: 9788883037214. Trieste, EUT Edizioni Università di Trieste.

Turconi MM, Mezzarobba S, Franco G, **Busan P**, Fornasa E, Jarmolowska J, Accardo A, Battaglini PP (2014) BCI-based neuro-rehabilitation treatment for Parkinson's Disease: Cases report. In: Bernardis, Paolo; Fantoni, Carlo; Gerbino, Walter. TSPC2014. Proceedings of the Trieste Symposium on Perception and Cognition, Trieste, November 27<sup>th</sup>-28<sup>th</sup>, 2015; p. 63-65; ISBN: 9788883036101. Trieste, EUT Edizioni Università di Trieste.

Catalan M, Mezzarobba S, Pellegrini L, **Busan P**, Belfiore M, Gorian A, Banica M, Cucca A, Sgubin G, Antonutti L, Pizzolato G (2013) Neurocognitive rehabilitation by improving motor planning versus treadmill training for freezing of gait in Parkinson's disease: a clinical and



transcranial magnetic stimulation (TMS) study. *Journal of Neurology*, vol. 260, Suppl. 1, p. S98. ISSN: 0340-5354. June 2013, Springer eds.

**Busan P**, Zanon M, Vinciati F, Monti F, Pizzolato G, Battaglini PP (2012) The organization of the neural networks involved in preparing reaching movements in humans investigated by the application of TMS and TMS/EEG. *Neuropsychological Trends* vol. 12, pp. 54-55. ISSN: 1970-321X. November 2012, Edizioni Universitarie di Lettere Economia Diritto – Milano. Congress of the Italian Society of Psychophysiology, Venice, November 2012.

**Busan P**, D'Ausilio A, Borelli M, Monti F, Pelamatti G, Pizzolato G, Fadiga L (2011) Transcranial magnetic stimulation in the study of the excitability of primary motor cortex in adult developmental stutterers. *Clinical Neurophysiology*, vol. 122, Suppl. 1: pp. S198-S199. ISSN: 1388-2457. Rome, June 2011; European Congress on Clinical Neurophysiology; Elsevier eds.

**Busan P** (2011) Study of the connectivity of the fronto-parietal circuits in humans by means of TMS/EEG co-registration. *Archives Italiennes de Biologie*, vol. 149, p. S4. ISSN:0003-9829. September 2011; Congress of the Italian Society of Psychophysiology, Brescia, November 14<sup>th</sup>-16<sup>th</sup> 2011; University of Pisa eds.

**Busan P**, Barbera C, Jarmolowska J, Monti F, Pelamatti G, Semenic M, Battaglini PP (2008) Mapping the dorsal stream in reaching movements: a TMS study. *FENS Abstracts*, vol. 4, p. 123.9; 6th FENS Forum. July 2008, FENS, Geneva, Switzerland.

Monti F, **Busan P**, Semenic M, Pizzolato G, Battaglini PP, Pelamatti G (2008) Investigating motor cortical system in developmental stuttering with TMS: a pilot study. *Clinical Neurophysiology*, vol. 119, Suppl. 1, p. S78. ISSN: 1388-2457. May 2008, Elsevier eds.

**Busan P**, Monti F, Semenic M, Battaglini PP (2007) Superior occipital lobe is involved in planning of reaching movements: evidence from transcranial magnetic stimulation. *Neural Plasticity*, vol. 2007, p. 23250. doi: 10.1155/2007/23250. ISSN: 0792-8483. Congress of the European Brain and Behavior Society, Trieste, September 2007, Hindawi Publishing Corporation eds.

Simonetto M, Stokelj D, Zanet L, **Busan P**, Semenic M, Monti F, Battaglini PP, Pizzolato G (2007) TMS in healthy subjects for the study of cortical areas involved in optic ataxia. *Neurological Sciences*, vol. 28 (Suppl.), p. S321. ISSN: 1590-1874. October 2007, Springer Italia eds.

**Busan P**, Pelamatti G, Tavano A, Grassi M, Fabbro F (2005) Improvement of verbal behaviour after pharmacological treatment of developmental stuttering: a case study. *Proceedings of DISS'05, Disfluency in Spontaneous Speech Workshop*, pp. 39-42. September 2005, ISCA Archivie eds., Aix-en-Provence, France.

### **Main contributions to National and International Congresses**

**Busan P**, Monti F, Semenic M, Battaglini PP (2007) Transcranial magnetic stimulation over superior parietal lobule delays reaction times in visually-guided reaching movements. Workshop on Concepts, Actions and Objects. Rovereto, April 19<sup>th</sup>-22<sup>nd</sup>, 2007.

**Busan P**, Monti F, Semenic M, Battaglini PP (2007) The dorsal stream for reaching in humans: opposite effects of TMS stimulation. Congress of Italian Neuroscience Society. Verona, September 27<sup>th</sup>-30<sup>th</sup>, 2007.

**Busan P**, Monti F, Semenic M, Battaglini PP (2007) Dorsal premotor activation follows parieto-occipital activation during planning of reaching movements: a TMS study. Cokroaches to culture: current controversies in cognition. Trieste, November 24<sup>th</sup>-25<sup>th</sup>, 2007.

Barbera C, **Busan P**, Monti F, Pelamatti G, Semenic M, Battaglini PP (2007) TMS study of dorsal parietal cortex during planning of reaching movement. Cokroaches to culture: current controversies in cognition. Trieste, November 24<sup>th</sup>-25<sup>th</sup>, 2007.

Jarmolowska J, **Busan P**, Monti F, Pelamatti G, Semenic M, Battaglini PP (2007) Parieto-occipital inhibition in ipsilateral reaching movements: a TMS approach. Cokroaches to culture: current controversies in cognition. Trieste, November, 24<sup>th</sup>-25<sup>th</sup>, 2007.

D'Ausilio A, Bufalari I, Salmas P, **Busan P**, Fadiga L (2009) Motor contribution to speech perception: articulation and phonation. Magstim TMS Summer School. London, UK, May 29<sup>th</sup>-30<sup>th</sup>, 2009.

D'Ausilio A, Bufalari I, Salmas P, **Busan P**, Fadiga L (2009) Il ruolo del sistema motorio nella percezione del parlato. Congresso della Società Italiana di Psicologia. Chieti, September, 24<sup>th</sup>-26<sup>th</sup>, 2009. (AIP Young Researchers Prize to Alessandro D'Ausilio).

**Busan P**, Barbera C, Bianchi F, Jarmolowska J, Monti F, Pelamatti G, Pizzolato G, Semenic M, Battaglini PP (2009) Bilateral mapping of the dorsal stream for reaching movements in humans: a TMS approach. Congresso della Società Italiana di Neuroscienze. Milan, October 2<sup>nd</sup>-5<sup>th</sup>, 2009.

**Busan P**, Della Mora A, Pizzolato G, Battaglini PP, Monti F (2010) Circuiti di connessione corticali studiati tramite co-registrazione TMS/EEG: evidenze dalla stimolazione della corteccia parieto-occipitale. Congress of the Italian Society of Clinical Neurophysiology. Siena, May 13<sup>th</sup>-15<sup>th</sup>, 2010.

Belluzzo M, **Busan P**, Vinciati F, Battaglini PP, Monti F, Pizzolato G (2010) Segregation of the neural route needed for planning of reaching movements in the hemisphere contra-lateral to moving hand: a TMS approach. Congress of the Italian Society of Neurology. Catania, October 23<sup>th</sup>-27<sup>th</sup>, 2010.

**Busan P**, Guerra V, Della Mora A, Jarmolowska J, Zanon M, Monti F, Pizzolato G, Battaglini PP (2011) The stream of cortical connections elicited by magnetic stimulation of the parieto-occipital cortex in humans: a TMS/EEG co-registration study. Workshop on Concepts, Actions and Objects. Rovereto, May 19<sup>th</sup>-22<sup>nd</sup>, 2011.

**Busan P**, Guerra V, Della Mora A, Jarmolowska J, Zanon M, Monti F, Pizzolato G, Battaglini PP (2011) Cortical connections investigated by magnetic stimulation of the parieto-occipital cortex: a

TMS/EEG co-registration study. SiNAPSA Neuroscience Conference '11. Ljubljana, September 22<sup>nd</sup>-25<sup>th</sup>, 2011.

**Busan P** (2011) Study of the connectivity of the fronto-parietal circuits in humans by means of TMS/EEG co-registration. **Invited oral communication**, Congress of the Italian Society of Psychophysiology, Brescia, November 14<sup>th</sup>-16<sup>th</sup>, 2011.

Turconi MM, Jarmolowska J, Fornasin J, **Busan P**, Battaglini PP (2012) Le interfacce cervello-computer nella paralisi completa (“locked-in”): nuovi approcci e prospettive. Congress of the Italian Society of Neurological Rehabilitation. Milan, May 3<sup>rd</sup>-5<sup>th</sup>, 2012.

**Busan P**, Mezzarobba S, Catalan M, Belfiore M, Sgubin G, Pellegrini L, Gorian A, Banica M, Pizzolato G, Battaglini PP (2013) Motor-cortex excitability and cognitive profiles after different rehabilitation programs in PD patients with freezing of gait. SiNAPSA Neuroscience Conference '13. Ljubljana, September 27<sup>th</sup>-29<sup>th</sup>, 2013.

**Busan P**, Del Ben G, Monti F, Battaglini PP (2015) Differences in intracortical inhibition of tongue motor representations between persistent adult developmental stutterers and normal speakers. Congress of the Italian Society of Clinical Neurophysiology, Verona, May 2015.

**Busan P** (2015). Transcranial magnetic stimulation in the neurophysiology of developmental stuttering. Young Neuroscientists Meeting, Trieste, June 19<sup>th</sup>, 2015 (**oral communication**).

**Busan P**, Del Ben G, Monti F, Bernardini S, Natarelli G, Battaglini PP (2015) Transcranial magnetic stimulation to evaluate tongue motor representations in adults with persistent developmental stuttering. International Conference on Stuttering, Rome, October 15<sup>th</sup>-17<sup>th</sup>, 2015 (**oral communication**).

**Busan P** (2016) Tongue motor representation in adults with persistent developmental stuttering: a TMS study. 2<sup>nd</sup> San Camillo Science Day, Venice, February 5<sup>th</sup>, 2016 (**oral communication**).

**Busan P**, Del Ben G, Russo R, Formaggio E, Monti F, Manganotti P, Battaglini PP (2016) Cortical reactivity and cortico-cortical interactions in persistent developmental stuttering investigated by TMS/EEG co-registration. Congress of the Italian Society of Psychophysiology, Milan, October 27<sup>th</sup>-29<sup>th</sup>, 2016 (**oral communication**).

**Busan P** (2017) Neurophysiology of developmental stuttering and models of speech motor control. **Invited oral communication**, AISV Congress “Congresso dell’Associazione Italiana della Società della Voce”, Pisa, January 25<sup>th</sup>-27<sup>th</sup>, 2017.

**Busan P** (2017) Neural dynamics of supplementary motor area of persistent developmental stutterers revealed by TMS/EEG co-registration. 3<sup>rd</sup> San Camillo Science Day, Venice, February 10<sup>th</sup>, 2017 (“**Best poster presentation**” award).

**Busan P** (2017) Stuttering: a model of impaired integration in sensory motor network. **Invited oral communication**, SiNAPSA Neuroscience Conference '17. Ljubljana, September 29<sup>th</sup>-30<sup>th</sup>, 2017.

**Busan P**, Del Ben G, Formaggio E, Arcara G, Manganotti P, Battaglini PP (2018). Neural dynamics of developmental stuttering: are we ready for neuromodulation interventions? Congress of the Italian Society of Neurological Rehabilitation, Trieste, April 5<sup>th</sup>-7<sup>th</sup>, 2018 (**oral communication**).

**Busan P**, Del Ben G, Formaggio E, Bernardini S, Natarelli G, Arcara G, Manganotti P, Battaglini PP (2018). Neural dynamics in persistent developmental stuttering: a suggestion for innovative treatments? International Conference on Stuttering, Rome, June 14<sup>th</sup>-16<sup>th</sup>, 2018 (**oral communication**).

**Busan P**, Del Ben G, Arcara G, Di Tomasso S, Weis L, Bernardini S, Piccione F. The modulation effect of “*arousal*” on the motor preparation of speech in developmental stuttering. Congress of the Italian Society of Psychophysiology, Ferrara, November 14<sup>th</sup>-16<sup>th</sup>, 2019 (**oral communication**).

### **Further information:**

**Other languages:** English.

### **Scientific awards**

*February 2019*

Grant from Italian Ministry of Health “Bando di Ricerca Finalizzata 2018 (Sezione Giovani Ricercatori)”: Principal Investigator for the project “The treatment of persistent developmental stuttering: shaping of motor neural functioning to improve fluency”;

*February 2017*

“Best poster presentation” award, 3rd San Camillo Science Day, February 10<sup>th</sup> 2017

“Neural dynamics of supplementary motor area of persistent developmental stutterers revealed by TMS/EEG co-registration”;

*September 2009*

SINS Congress, Milan, October 2<sup>nd</sup>-5<sup>th</sup>, 2009

Travel fellowship awarded by Italian Neuroscience Society (SINS)

### **International scientific collaborations**

*2010-2018*

Collaboration with Prof. Janez Zidar and his research group (Institute of Clinical Neurophysiology, University Medical Centre Ljubljana); published papers:

-Rakusa M, Busan P, Battaglini PP, Zidar J (2018). Separating the idea from the action: A sLORETA study. *Brain Topography*, vol. 31, pp. 228-241.

*2015-2017*

Collaboration with Prof. Martin Sommer (Department of Clinical Neurophysiology, Georg-August University, Gottingen, Germania); published papers:

-Busan P, Battaglini PP, Sommer M (2017). Transcranial magnetic stimulation in developmental stuttering: relations with previous neurophysiological research and future perspectives. *Clinical Neurophysiology*, vol. 128, pp. 952-964.

**Areas of scientific interest/experience:**

Neurophysiology of stuttering and possible rehabilitation solutions; Brain connectivity in healthy adults and stutterers; Cerebral circuits involved in movement, speech/language, and mirror neurons system; Neurophysiology of Parkinson's Disease; Cerebral circuits involved in visuo-motor coordinates transformations in healthy subjects and after injuries (stroke); Brain Computer Interfaces; Neuropsychology assessment of cognitive disorders in adults; Groups and single case experimental designs; Statistical models for analysis in groups and single case data.

**Scientific techniques:**

**Transcranial Magnetic Stimulation (TMS)** in the study of movement, speech/language, and mirror neurons systems; TMS in the study of motor evoked potentials in healthy humans and in patients (Parkinson's Disease, stuttering), and in the study of visuo-motor coordinates transformation;

**TMS/EEG co-registration** in the study of movement and speech/language systems; TMS/EEG in the study of motor evoked potentials in healthy humans and in patients (Parkinson's Disease, stuttering), in the study of visuo-motor coordinates transformation (visuo-motor parieto-frontal and fronto-parietal connections). Data analysis mainly conducted with sLORETA, EEGLAB for Matlab and Neuroscan;

**Brain Computer Interface (BCI):** setting of an effective BCI system for communication and for neurofeedback in healthy subjects and in patients by using evoked potentials and/or sensorimotor rhythms;

**Statistical softwares:** Windows SPSS, Statistica for Windows, and R;

**Other softwares:** Labview, DOS QBasic, Matlab, E-Prime, PsychoPy;

**Magnetoencephalography;**

**Neuropsychology testing and assessment.**

Sincerely,

Pierpaolo Busan

