

CLAUDIA CASELLATO

Curriculum vitae

EDUCATION AND FORMATION COURSES

- Jan 2007- March 2011 – **European Ph.D. in Bioengineering**, Politecnico di Milano. Thesis: “*Investigations on physiological and pathological sensory-motor control: from biomechanics to brain functional imaging*”; supervisor: Prof A. Pedrocchi
- Nov 2006 – **Qualification to the profession of engineer**
- Sept 2009 - February 2010 and September 2005 -January 2006 – Université de Bourgogne (Laboratory INSERM ERM 207), Dijon (France). Collaboration for Master thesis and for Ph.D. research activities
- April 2006 – **Master degree in Bioengineering** (mark: 110/110) at Politecnico di Milano. Thesis: “*Plasticity of motor control: analysis of muscular synergies in pointing movement protocol during transient microgravity*”, in collaboration with Université de Bourgogne; supervisor: Prof A. Pedrocchi
- Jan- June 2004 – **International program ERASMUS/SOCRATES** at the NTNU (Norwegian University of Science and Technology), Trondheim (Norway)
- Oct 2003 – **Bachelor degree in Bioengineering** (mark: 107/110) at Politecnico di Milano
- July 2000 – **High school diploma** (mark: 100/100), at Liceo S.S. Vittorio Veneto, Milano

- Course “English as a Medium of Instruction” at Unipv (Febr 2021)
- Course “CINECA: parallel computing for brain simulation” – Bologna (July 2018)
- School “Big data, neuroscience and law” - Centre for Health Technologies – Pavia (Sept 2017)
- Course “Introduction to Marconi High Performance Computing Cluster, for users and developers (CINECA)” (April 2017)
- Course “Supercomputing - FutureLearn PRACE” (online course) (2017)
- Workshop on Neural Simulator NEST – Karlsruhe (2016) and Julich (2017)
- Summer School “Soft Robotics” – ETHZ, Zurich (2012)
- Summer School “Neurophysiology” – Padova (2011)
- Summer School “Neurorobotics” - Sant’Anna Institute, Pisa (2007)

WORK EXPERIENCES: CONTRACTS

- 1 April 2023 – now – **Associate Professor** at Dept. of Brain and Behavioral Sciences, University of Pavia, Italy.
- 1 April 2020 – 31 March 2023 – **Senior Assistant Professor** (Ricercatore a t.d. - t.pieno - art. 24 c.3-b L. 240/10) at Dept. of Brain and Behavioral Sciences, University of Pavia, Italy.
- July 2017- March 2020 – **Assistant Professor** (Ricercatore a t.d. - t.pieno - art. 24 c.3-a L. 240/10) at Dept. of Brain and Behavioral Sciences, University of Pavia, Italy. Funding: Human Brain Project
- March 2011- July 2017 – **Post-doc Research Fellow** at Dept. of Electronics, Information and Bioengineering (at NeuroEngineering and medical robotics laboratory), Politecnico di Milano, Italy

NATIONAL SCIENTIFIC QUALIFICATION

National Scientific Academic Qualification as Associate Professor - sector: Electronic and Informatic Bioengineering (Abilitazione Scientifica Nazionale – ASN, Professore II fascia. Settore concorsuale: 09/G2 BIOINGEGNERIA). Validity from 16/10/2018 to 16/10/2024

BRIEF SUMMARY OF THE SCIENTIFIC PROFILE

My research interests and activities have been and are oriented to deal with the fascinating topic of **motor learning and control**, by tackling the issue both through an empirical and computational approach. The experimental approach involves to develop **set-up and protocols** able to detect and interfere with the learning process in physiological and pathological conditions. The computational approach involves the reconstruction of **neural circuit models** and their embedding **into behavioral loops**, able to implicitly generate high-level motor functions from elementary neural features and circuit mechanisms, **in physiological and pathological conditions** as well.

- **Computational Neuroscience and Neurorobotics.** Reconstruction of the cerebellar microcircuit, with multiple neuron types, structural and functional connectivity, based on the most updated neurophysiological data. Plasticity mechanisms within the network in closed-loop control systems to investigate the learning properties, also in cerebellar pathological states or under neural perturbations. Use of multiple neural simulators (Python-NEST, Python-NEURON). Real-time approaches have been used for embedding these networks as brain-inspired controllers in real robots. Different behavioral tasks have been designed and implemented to test complex motor and memory skills driven by the cerebellar network. My work in this framework was within EU projects (Human Brain Project - SP6 Brain Simulation; REALNET - WP5 “Development of robotic simulators and real integrated robotic platform with brain-inspired controllers for complex motor and memory tasks”), with closed international collaborations. I have daily supervised 2 PhD students on these topics, at Politecnico di Milano. I’m actually coordinating a team of Post-docs at Neurocomputation lab at Dept. of Brain and Behavioral Sciences, University of Pavia.
- **Neurorehabilitative and assistive tool development for movement disorders**
 - EMG-based biofeedback, and myocontrol of robotic devices: set-up development and clinical studies with dystonic children. I have established a strong collaboration with Prof. T. Sanger (USC, Los Angeles), IRCCS Neurological Institute C. Besta (Milano) and IRCCS Institute E. Medea (Lecco, Italy). I participated in the design of a NIH grant actually ongoing. I have daily supervised 1 PhD student on this topic, at Politecnico di Milano
 - Eye-tracking for neuroprosthesis control: development of eye-tracking module control for neurological patients’ intention detection. My work in this framework was within EU project MUNDUS, specifically on WP4 “Head/gaze end effector control”
- **Human physiological and pathological motor control**
 - Motor control in weightlessness: adaptation in transient (parabolic flights) and long-term (International Space Station -ISS) microgravity. My work was within projects funded and supported by Italian, European and NASA Space Agencies. I carried out experimental campaigns at Johnson Space Center in Houston on astronauts (pre and post flight) and through remote support from International Space Station (in-flight). For the HW development and flight certification I worked with the Engineering Society Kayser Italia (Livorno, Italy). I participated at parabolic flight experimental campaigns organized by Novespace.
 - Motor control in movement disorders: muscular and kinematic strategies in dystonic patients, learning skills under dynamic perturbation. I worked on the set-up and analyses methods, and carried out clinical tests with patient recruitment managed by neurologists at IRCCS Neurological Institute C. Besta (Milano)
 - Movement-related neuroimaging: simultaneous measurements of kinematics and Functional Magnetic Resonance Imaging. I worked in collaboration with Rehabilitative Center Villa Beretta (Lecco, Italy)

ROLES IN SCIENTIFIC PROJECTS

- SCIENTIFIC RESPONSIBILITY
 - **PI of the PRIN project 20228B2HN5 “cerebellar NEuromodulation in ATaxia: digital cerebellar twin to predict the MOVEment rescue (NEAT-MOVE)”** (CUP master: F53D23005950006310) – from 20th Oct 2023
 - **Co-PI of Spoke2, member of the Scientific Technical Committee of the PNRR project “MNESYS”** (*Progetto PNRR Partenariato Esteso neuroscienze e neurofarmacologia*)
 - **Task responsible in the PNRR project “CN1 - In Silico Medicine”** (Spoke8-WP2)
 - **Sub-project responsible in the PNC project Fit4MedRob** (Piano nazionale per gli investimenti complementari al PNRR) (Mission 3/ Activity 8-9 / AI & Control)
 - **Scientific vice-director of Cerebellum Modelling Hub** at University of Pavia [<https://www.humanbrainproject.eu/en/collaborate/facility-hubs/>]. Multiscale modelling, spanning from neurons and microcircuits to large-scale networks and the whole brain, contributions to brain-inspired technologies and treatments for brain diseases
 - **Co-PI for the unit Pavia University in the project “Whole-brain rodent spiking neural networks”** – HBP OpenCall for SGA3 2020-2023 “Rodent Microcircuits”
 - **Co-PI for the unit Pavia University in the project “ARBOR Implementation of the Inferior Olive Network”** – HBP Open Call for SGA3 2020-2023 “Preparing Cellular-Level Models for Portable HPC Simulation using Arbor”

- **Principal Investigator** of projects “HBP_Nest” and “NEST multi-scale simulations of EyeBlink Conditioning” (high performance computing resources from CINECA for cerebellar modelling in Human Brain Project), 2018 and 2019 (CINECA ISCRA programme)
- **Winner** of “Fondo per il finanziamento delle attività base di ricerca” MIUR 2018
- **PARTECIPATION**
 - EU project **EBRAINS 2.0**. Neuro-inspired computing. 2024-2026
 - EU project “**Virtual brain twin** for personalised treatment of psychiatric disorders”. Horizon Health Europe Calls 2023. 2024-2028
 - **MNESYS** Neuroscience PNRR project. Computational neural models of pathologies.
 - **Fit4medRob** PNC/PNRR project. Robotic research and artificial intelligence.
 - **CN1- In Silico Medicine** PNRR project. Multiscale brain modeling on HPC for in silico medicine solutions
 - **EBRAINS-Italy** PNRR project. Neuroinformatic tools
 - **Human Brain Project Horizon 2020** Framework Programme for Research and Innovation – SGA1 (Grant Agreement No. 720270, 2016-2018), SGA2 (Grant Agreement No. 785907, 2018-2020), SGA3 (Grant Agreement No. 945539, 2020-2023). My main task: cerebellar microcircuit models in the Brain Simulation Platforms
 - **Partnering Project** CerebNEST (Human Brain Project) (2017-now). My main task: cerebellar microcircuit models into neurorobotic environments
 - **Co-Design Project** “Mouse-Based Cellular Cortical and Sub-Cortical Microcircuit Models” (Human Brain Project) (2018-now) [www.humanbrainproject.eu/en/about/project-structure/codesign-projects/#CDP2]. My main task: multiple brain areas in a modular architecture, embedded in functional behavioral loops
 - **NIH project** “Multi-center trial of Augmented Sensory Feedback in Children with Dyskinetic CP”, funded by the US National Institute of Health (NIH grant: 1R01HD081346; 2013-2019; Subaward: 61430868). PI: Prof T Sanger (Children Hospital Los Angeles; Dept. Bioengineering USC, Los Angeles) [https://projectreporter.nih.gov/project_info_description.cfm?projectnumber=5R01HD081346-04]. My main task: set-up validation, clinical acquisitions and data analysis
 - **European project REALNET** “Realistic Real-time Networks: computation dynamics in the Cerebellum” (ICT-2009.6 FET Proactive GA 270434, 2011-2014) [<https://cordis.europa.eu/project/rcn/97465/factsheet/it>]. My main task: simplified cerebellar spiking networks into real robots
 - **European project MUNDUS** “MUltimodal Neuroprosthesis for Daily Upper limb Support” (ICT-2009.7.2 Accessible and Assistive ICT GA 248326, 2010-2013) [<https://cordis.europa.eu/project/rcn/94288/it>]. My main task: eye-tracking module for patient’s intention detection
 - Projects “MOVE and SLINK”, funded by **ASI (Italian Space Agency)** (2013-038-I.0), in collaboration **with NASA**. My main task: support for in-flight set-up development and testing, protocol design, and experimental acquisitions on astronauts
 - Project “Resistive countermeasure - ARED kinematics”, funded by **ASI (Italian Space Agency)** (2013-065-R.0), in collaboration **with ESA**. My main task: support for in-flight set-up testing, protocol design, and experimental acquisitions
 - Project “Tridimensional Ballistocardiography in microgravity”, funded by **ASI (Italian Space Agency)** (2013-064-R.0), in collaboration **with ESA**. My main task: onground experimental acquisitions

SPEAKER AT INTERNATIONAL AND NATIONAL SCIENTIFIC CONFERENCES, WORKSHOPS AND SCHOOLS

- **INVITED TALKS**
 - “*Motor control circuits: neural bases and modelling*” at Summer school neuroscience – PhD course in neuroscience, Sept 2023, Genova (Italy)
 - “*Point neuron models and spiking neural networks*” and “*Hands-on sessions*” at School of Brain Cells & Circuits Camillo Golgi “Modelling the brain”, Dec 2022, Erice (Italy)
 - “*The cerebellum-centered system: from reconstruction to simulations of sensorimotor tasks*” at HBP WP3 in-person meeting “Adaptive networks for cognitive architectures”, Sept 2022, Amsterdam.
 - “*Modeling pipeline for the Cerebellum*”, at EBRAINS Brain Simulation School, June 2022, Palermo (Italy)
 - “*Workshop: The Brain Scaffold Builder: a new framework for realistic brain modelling (the cerebellar use case)*”, at 6th HBP Student Conference, Febr 2022, online

- “Brain scaffold builders” at School of Brain Cells & Circuits Camillo Golgi “Modelling the brain: Elementary components to explain ensemble functions”, Dec 2021, Erice (Italy)
- “BSB design and use cases” HBP CodeJam#12- Nov 2021, online
- “Single neurons and circuits of the cerebellum”, at Symposium “New vistas on cerebellar circuit dynamics”, 71st SIF National Congress, Sept 2021, online
- “Realistic models of cerebellar circuit into brain systems”, at Lake Como School “Neural circuit complexity: Neuroscience, Models and Robotics (BrainCosmos)”, August 2021, Como (Italy)
- “Microcircuit models”. At XXIV School of Physiology and Biophysics 2021 “Neuronal biophysics: from experiments to models”, July 2021, Pavia (Italy)
- “Brain Computational Modelling in EBRAINS: The cerebellum usecase “ EITN workshop on “Computational Neuroscience in EBRAINS” Jun 2021, online
- “Visuomotor tasks by cerebellar-based control systems” at Bernstein Conference, workshop “Visuomotor coordination: from physiology to control systems”, Sept 2020, online
- “Sistemi adattivi bio-ispirati: modelli computazionali del cervelletto con capacità di apprendimento” corso “Intelligenza artificiale: un percorso tra uomo e computer”, May 2020, Collegio Borromeo, Pavia (Italy)
- “Reconstruction and simulation of the cerebellar microcircuit”, at 4th HBP Student Conference, Jan 2020, Pisa (Italy)
- “Reconstruction and simulation of the cerebellar microcircuit”, at CodeJam#10 EBRAINS “Integration and Workflows”, Nov 2019, Heidelberg (Germany)
- “Ricostruzione e simulazione del microcircuito cerebellare: uno scaffold versatile per diversi livelli di dettaglio e di scala”, at CINECA, workshop “HPC solution for Neuroscience”, June 2019, Bologna (Italy)
- “Reconstruction and simulation of the cerebellar microcircuit: a scaffold strategy to embed different levels of neuronal details”, at CNS, workshop “Generative connectomics and plasticity”, July 2019, Barcelona (Spain)
- “Proof of concept of pathology modelling with closed loop simulations”, at School of Brain Cells & Circuits Camillo Golgi “Modeling the brain and its pathologies”, Aug 2019, Erice (Italy)
- “Cerebellar microcircuit: from models to behaviors”, at Erasmus MC, June 2018, Rotterdam (Holland)
- “Cerebellar microcircuit: from models to behaviors”, at Dept. of Electrical Engineering, Technical University of Denmark, March 2018, Copenhagen (Denmark)
- “Microcircuits in action: towards bottom-up modeling of brain function”, at School of Brain Cells & Circuits Camillo Golgi “From cell physiology to integrated signals and emerging brain functions”, Dec 2017, Erice (Italy)
- “Robotic learning by cerebellar spiking controller”, at FENS Satellite Event “Biologically-based models of neurons and microcircuits”, July 2014, Pavia (Italy)
- *Brain-inspired robotic control: learning in cerebellum-driven movement tasks through a cerebellar realistic model*, at CNS workshop “Computations in the cerebellar circuit”, July 2013, Paris (France)

SCIENTIFIC WORKSHOP ORGANIZATION AND MEMBERSHIPS

- Scientific committee member of School SIF *Neuronal biophysics: from experiments to models*. Pavia, 5-7 July 2021 [<https://sfb2021.azuleon.org/>]
- Scientific organizer of mini-symposium *Multiscale brain modelling*, at 10th International IEEE EMBS Conference on Neural Engineering. May 2021
- Scientific organizer of *Hackathon on cerebellum modeling*, HBP Education. 13-15 January 2020, University of Pavia. Talks on cerebellum models and tutorials for their development and applications, using Human Brain Project infrastructures [<https://www.humanbrainproject.eu/en/education/participatecollaborate/infrastructure-events-trainings/hackathon-on-cerebellum-modelling/>]
- Member of Society for Neuroscience (SfN)
- Member of Organization for Computational Neurosciences (OCNS)

AWARDS AND SCHOLARSHIPS

- Best poster at HBP Summit Athens 2020. *Cerebellum: advanced neuron and microcircuit models*. De Schepper et al.
- Travel award at Organization for Computational Neurosciences 2019 [www.cnsorg.org/cns-2019]
- Best paper at 7th International IEEE/EMBS Conference on Neural Engineering 2015 (Montpellier, France)
- Best poster at School of Brain Cells & Circuits “Camillo Golgi” 2015 (Erice, Italia)

- NCM (Neural Control of Movement) society scholarship 2011
- Zonta International Amelia Earhart Fellowship 2008

REVIEW ACTIVITIES

- **Scientific Reviewer** for: *Agence Nationale de la Recherche* (2020 generic call for proposals); *DMRF GRANT* (2023); *EUTOPIA* (2023)
- **Review Editor** in the Editorial Board of *Frontiers in Robotics and AI*, and in *Neurorobotics*
- Referee for several peer-reviewed indexed Journals, e.g. *Scientific Reports*, *Neurocomputing*, *International Journal of Neural Systems*, *Journal of NeuroEngineering and Rehabilitation*, *PLoS*, *IEEE Transactions on Robotics*, *Frontiers in Bioengineering and Biotechnology*, *Transactions on Neural Systems and Rehabilitation Engineering*, *Neural Networks*.

ACADEMIC ROLES

- Member of the **Academic Board of PhD program “Biomedical Science”** at University of Pavia (2019/present)
- Member of **Council of the Dept. of Brain and Behavioral Sciences**, University of Pavia, 2022-2025 (D.R. n. 2373/2023 on 16/10/2023)
- Co-organizer of Master Degree in **Human-centered Artificial Intelligence** inter-University – Curriculum “Neuro-AI” [<https://hcai.cdl.unimi.it/en>]
- Co-organizer of Bachelor Degree in **Artificial Intelligence** inter-University [approved by CUN in Febr 2021] [<https://bai.unipv.it/>]
- Member of the **Academic Board of National PhD program “Artificial Intelligence”**, coordinated by Campus Biomedico Roma (Sept 2022)
- **PhD external examiner** at Doctorate in Bioengineering and Robotics – University of Genova (May 2022)
- **PhD external examiner** at Robotics Laboratory, Faculty of Environment and Technology, University of the West of England, Bristol, UK (Sept 2019)
- Scientific support for **VQR 15-19** for the Dept. of Brain and Behavioral Sciences, University of Pavia

TEACHING ACTIVITIES

- MAIN TEACHER
 - 2023/present: “Brain modeling” (6 ECTS) in the bachelor degree *Artificial Intelligence* <https://bai.unipv.it/>
 - 2023/present: “Brain modelling for biomedicine and ICT” (3 ECTS) in the master degree *Human-centered Artificial Intelligence* <https://hcai.cdl.unimi.it/en>
 - 2021/present: PhD course “Programming” (3 ECTS) for PhD in Biomedical Science, at University of Pavia
 - 2018/present: “Neural modelling and computation” (6 ECTS) for Master Degree (MSc) in Psychology, neuroscience and human sciences (in English); at University of Pavia and University School for Advanced Studies IUSS, Pavia
 - 2018/present: “Fisiopatologia e Immunologia” (16 hours of frontal lectures): Neurophysiology bases, biomechanics, fluidodynamics, thermodynamics; at Osteopathy University School TCIO, Milano
 - 2015/2018: PhD course “Methods and techniques for research in neuroscience”. Specific topic (1 ECTS): “Computational Model of Brain: from molecular level to microcircuits models”; at Politecnico di Milano
 - 2014/2018: “Fisica e Biofisica” (16 hours of frontal lectures); at Osteopathy University School TCIO, Milano
- TEACHING ASSISTANT
 - 2012/2015: Master course Neuroengineering (main teacher: Prof. A. Pedrocchi), (12 hours; 17 hours); at Biomedical Engineering at Politecnico di Milano
 - 2012/2013: Master course Laboratory of Medical Robotics and surgery technology (5 hours), at Biomedical Engineering at Politecnico di Milano
 - 2010/2015: PhD courses “Medical Robotics” and “Human friendly robotics”. Laboratory class: Brain-inspired robotics; at Politecnico di Milano
- Supervisor of several **Master theses** in Psychology, neuroscience and human sciences; and in Neurobiology, at University of Pavia

- Supervisor and co-supervisor of **6 PhD theses** in Biomedical Sciences at University of Pavia (Italy):
 - Roberta Lorenzi (dissertation Dec 2022, “*Development of a cerebellar mean field model: the theoretical framework, the implementation and the first application*”)
 - Robin De Schepper (dissertation Dec 2023, “*Building the cerebellum (and the Brain Scaffold Builder)*”)
 - Dianela Osorio (ongoing, within the EU project “Cerebellum and emotional networks”, H2020-MSCA-ITN-2020)
 - Marialaura De Grazia (ongoing, multiscale brain modeling in ataxia)
 - Eleonora Lupi (ongoing – national PhD in AI, “*Toward Brain Digital Twins: integration of biophysical features in virtual brain models of healthy and pathological brain*”)
 - Emiliano Buttarazzi (ongoing – national PhD in AI, embodiment of brain models in robotic controllers)
- Co-supervisor of **3 PhD thesis** in Bioengineering at Politecnico di Milano (Italy):
 - F. Lunardini, *Functional assessment methods and EMG-based interventions for children with dystonia* – May 2016 (PhD Award CNR- IEIIT GNB 2016)
 - A. Antonietti, *Computational cerebellar models and their embodiment in behavioral loops to understand neural bases of motor learning* – May 2018 (PhD Award GNB 2018)
 - A. Geminiani, *Simulations of cerebellar networks towards understanding of pathologies, linking complex neuronal models to behavior* – July 2019 (PhD Award GNB 2019)

OVERALL SCIENTIFIC PRODUCTION

SCOPUS AUTHOR ID: 36558806300; ORCID.ORG/0000-0002-8729-0391;

TOT CITATIONS=1232; H-INDEX = 21 [SCOPUS ON MAY 2024]; TOT CITATIONS=1792; H-INDEX = 25 [SCHOLAR ON MAY 2024];

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- 43 articles on international peer-reviewed indexed Journals
 - more than 40 publications on international peer-reviewed indexed Conference Proceedings
 - 3 book chapters
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Articles on international peer-reviewed Journals

- Tesler F, Lorenzi R, Ponzi A, Casellato C, Palesi F, Gandolfi D, Gandini Wheeler-Kingshott C, Mapelli J, D'Angelo, E, Migliore M and Destexhe A. *Multiscale modelling of neuronal dynamics in hippocampus CA1*. SUBMITTED 2024
- Geminiani A, Casellato C, Boele H-J, Pedrocchi, De Zeeuw C I, D'Angelo E. *Mesoscale simulations predict the role of synergistic cerebellar plasticity during classical eyeblink conditioning*. PLOS COMP BIO. 2024; doi: 10.1371/journal.pcbi.1011277
- Ciapponi C, Li Y, Osorio D.A., Rodarie D, Casellato C, Mapelli L, D'Angelo E. *Variations on the theme: focus on cerebellum and emotional processing*. FRONT SYST NEUROSCI. 2023; doi: 10.3389/fnsys.2023.1185752
- Lorenzi R, Geminiani A, Zerlaut Y, De Grazia M, Destexhe A, Gandini C.A.M, Palesi F, Casellato C and D'Angelo E. *A multi-layer mean-field model of the cerebellum embedding microstructure and population-specific dynamics*. PLOS COMP BIO. 2023; doi: 10.1371/journal.pcbi.1011434
- De Schepper R, Geminiani A, Masoli S, Rizza MF, Antonietti A, Casellato C*, D'Angelo E* (*co-last authors). *Model simulations unveil the structure-function-dynamics relationship of the cerebellar cortical microcircuit*. NAT COMMS BIOL. 2022; doi: 10.1038/s42003-022-04213-y
- Gandolfi D, Mapelli J, Solinas S, De Schepper R, Geminiani A, Casellato C, D'Angelo E, Migliore M. *A realistic morpho-anatomical connection strategy for modelling full-scale point-neuron microcircuits*. SCI. REP. 2022; doi: 10.1038/s41598-022-18024-y.
- Geminiani A, Mockevičius A, D'Angelo E, Casellato C. *Cerebellum Involvement in Dystonia During Associative Motor Learning: Insights From a Data-Driven Spiking Network Model*. FRONT. SYST. NEUROSCI. 2022; doi: 10.3389/fnsys.2022.919761
- Grillo M, Geminiani A, Alessandro C, D'Angelo E, Pedrocchi A and Casellato C. *Bayesian Integration in a Spiking Neural System for Sensorimotor Control*. NEURAL COMPUTATION 2022; doi: 10.1162/neco_a_01525
- Antonietti A, Geminiani A, Negri E, D'Angelo E, Casellato C and Pedrocchi A. *Brain-Inspired Spiking Neural Network Controller for a Neurobotic Whisker System*. FRONT. NEUROBOT 2022; doi: 10.3389/fnbot.2022.817948
- Fruzzetti L, Kalidindi HT, Antonietti A, Alessandro C, Geminiani A, Casellato C, Falotico E, D'Angelo E. *Dual STDP processes at Purkinje cells contribute to distinct improvements in accuracy and speed of saccadic eye movements*. PLOS COMPUT BIO. 2022; doi: 10.1371/journal.pcbi.1010564
- Kuriyama R, Casellato C, D'Angelo E, Yamazaki T. *Real-time simulation of a cerebellar scaffold model on graphics*

processing units, FRONT CELL NEUROSCI 2021; doi: 10.3389/fncel.2021.623552

- Bogdan PA, Marcinnò B, Casellato C, Casali S, Rowley A, Hopkins M, Leporati F, D'Angelo E, Rhodes O. *Towards a bio-inspired real-time neuromorphic cerebellum*, FRONT CELL NEUROSCI 2021; doi: 10.3389/fncel.2021.622870
- Palesi F, Lorenzi R, Casellato C, Ritter P, Jirsa V, Gandini Wheeler-Kingshott C, D'Angelo E. *The importance of cerebellar connectivity on simulated brain dynamics*, FRONT CELL NEUROSCI 2020; 14:240 doi: 10.3389/fncel.2020.00240
- Casellato C, Ambrosini E, Galbiati A, Biffi E, Cesareo A, Beretta E, Lunardini F, Zorzi G, Sanger T, Pedrocchi A. *EMG-based vibro-tactile biofeedback training: effective learning accelerator for children and adolescents with dystonia? A pilot crossover trial*. J NEUROENG REHABIL 2019; 16(1):150; doi: 10.1186/s12984-019-0620-y
- Geminiani A, Pedrocchi A, D'Angelo E, Casellato C. *Response Dynamics in an Olivocerebellar Spiking Neural Network With Non-linear Neuron Properties*. FRONT. COMPUT. NEUROSCI. 2019; 13:68; doi: 10.3389/fncom.2019.00068
- Geminiani A, Casellato C, Pedrocchi A, D'Angelo E. *Complex Electroresponsive Dynamics in Olivocerebellar Neurons Represented With Extended-Generalized Leaky Integrate and Fire Models*. FRONT. COMPUT. NEUROSCI. 2019; 6:13:35; doi: 10.3389/fncom.2019.00035
- Casali S, Marenzi E, Medini C, Casellato C*, D'Angelo E* (*co-last authors). *Reconstruction and Simulation of a Scaffold Model of the Cerebellar Network*. FRONT. NEUROINFORM. 2019; 15, 13:37. doi: 10.3389/fninf.2019.00037
- Geminiani A, Casellato C, Locatelli F, Prestori F, Pedrocchi A, D'Angelo E. *Complex dynamics in simplified neuronal models: reproducing Golgi cell electroresponsiveness*. FRONT. NEUROINFORM. 2018; 12, 1–19; doi:10.3389/fninf.2018.00088
- Antonietti A, Martina D, Casellato C, D'Angelo E, Pedrocchi A. *Control of a humanoid NAO robot by an adaptive bioinspired cerebellar module in 3D motion tasks*. COMPUT. INTELL. NEUROSCI. 2019; 4862157 doi:10.1155/2019/4862157
- Antonietti A, Monaco J, D'Angelo E, Pedrocchi A, Casellato C. *Dynamic Redistribution of Plasticity in a Cerebellar Spiking Neural Network Reproducing An Associative Learning Task Perturbed by TMS*. INT J NEURAL SYST 2018; 28(9); doi: 10.1142/S012906571850020X
- Geminiani A, Casellato C, Antonietti A, D'Angelo E, and Pedrocchi A. *A multiple-plasticity spiking neural network embedded in a closed-loop control system to model cerebellar pathologies*. INT J NEURAL SYST 2018; 28; doi: 10.1142/S0129065717500174
- Lunardini F, Casellato C, Bertuccio M, Sanger TD, Pedrocchi A. *Children with and without dystonia share common muscle synergies while performing writing tasks*. ANNALS BIOMED ENG 2017; 1-14;doi:10.1007/s10439-017-1838-0
- Martin-Yebra A, Landreani F, Casellato C; Pavan E, Migeotte PF, Frigo C, Martinez Cortes J, Caiani E. *Evaluation of respiratory- and postural-induced changes on the ballistocardiogram signal by time warping averaging*. PHYSIOL. MEAS. 2017; doi: 10.1088/1361-6579/aa72b0
- D'Angelo E, Antonietti A, Casali S, Casellato C, et al. *Modelling the cerebellar microcircuit: new strategies for a long-standing issue*. FRONT. CELL. NEUROSCI. 2016; 10:176; doi: 10.3389/fncel.2016.00176
- Antonietti A, Casellato C, D'Angelo E, and Pedrocchi A. *Model-driven Analysis of Eyeblink Classical Conditioning Reveals the Underlying Structure of Cerebellar Plasticity and Neuronal Activity*. IEEE TRANS NEURAL NETW LEARN SYST. 2017; doi: 10.1109/TNNLS.2016.2598190
- Casellato C, Pedrocchi A, Ferrigno G. *Whole-body movements in long-term weightlessness: hierarchies of the controlled variables are gravity-dependent*. J. MOT. BEHAV. 2017; 1-12; doi: 10.1080/00222895.2016.1247032
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