Massimo Silvetti

Curriculum Vitae

Rome
24 June 2025

Part I – General Information

Full Name	Massimo Silvetti
Date of Birth	
Place of Birth	Rome
Citizenship	Italian
Permanent Address	
Mobile Phone Number	
E-mail	
Web page	https://www.istc.cnr.it/en/people/massimo-silvetti
Spoken Languages	Italian (native speaker), English (fluent)

Part II – Education and titles

Type	Year	Institution	Notes (Degree, Experience,…)
Licensure	2023	MUR (Italian Ministry of University and Research)	National Scientific Qualification (ASN) as a Full Professor (I fascia) SC 11/E1
Licensure	2023	MUR (Italian Ministry of University and Research)	National Scientific Qualification (ASN) as a Full Professor (I fascia) SC 05/D1
Specialty	2020	Translational Neuromodeling Unit (TNU), University of Zurich & ETH Zurich, Switzerland	Postgraduate course in Computational Psychiatry
Specialty	2018	Institute of Cognitive Sciences and Technologies (ISTC), National Research Council (CNR), Italy	One year long training in humanoid robotics (funded by FWO grant V409517N)
Specialty	2015	Faculty of Engineering, Kyoto University, Kyoto, Japan	Postgraduate course in Machine Learning
Specialty	2013	Swiss Federal Institute of Technology (ETH), Zurich, Switzerland	Postgraduate Course in MRI data analysis (SPM)
PhD	2007	Ph.D. school in Behavioural Neuroscience. Sapienza University, Rome, (Italy)	PhD in Cognitive Neuroscience, **Thesis in computational neuroscience: "RBF Network for Coordinates Transformation and Correlated Noise Filtering"**.

University graduation	2003	Faculty of Medicine and Psychology, Sapienza University (Italy),	MSc (summa cum laude), laurea V.O. with customized curriculum (piano degli studi personalizzato) in **human biology (15 annual exams), psychology (10 annual exams) and artificial intelligence (2 annual exams)**. **Thesis in computational neuroscience.**

Part III – Academic Appointments

Star	End	Institution	Position
Jan. 2023	Tenured	Institute of Cognitive Sciences and Technologies (ISTC), National Research Council (CNR), Italy	**Senior Researcher**(Ricercatore II livello, tempo indeterminato). Research topics: computational neuroscience, neuroimaging, computational psychiatry,
Nov. 2018	Tenured	Institute of Cognitive Sciences and Technologies (ISTC), National Research Council (CNR), Italy	**Researcher** (Ricercatore III livello, tempo indeterminato). Research topics: computational neuroscience, neuroimaging, computational psychiatry,
May 2018	April 2020	Institute of Cognitive Sciences and Technology (ISTC), National Research Council (CNR), Italy	**Marie Sklodowska-Curie IF Research fellow** (grant 795919). Research topics: computational neuroscience of decision-making applied to humanoid robots.
Oct. 2012	April 2018	Ghent University (Belgium), Department of Experimental Psychology; Ghent University Hospital, Neuroimaging Lab (GIFMI).	**Researcher (eq. RTD-A)** Research topics: Computational neuroscience and neuroimaging of decision-making
Oct. 2009	Sept. 2012	Ghent University (Belgium), Department of Experimental Psychology; Ghent University Hospital, Neuroimaging Lab (GIFMI).	**Postdoctoral fellow** Research topics: Computational neuroscience and neuroimaging of decision-making
Dec. 2006	Oct. 2009	Sapienza University (Italy), Department of Psychology 39	**Postdoctoral fellow (co.co.pro. + assegno di ricerca)**. Research topics: Computational neuroscience and neuroimaging of visual attention

Part IV – Teaching experience

IVA – Teaching experience

Year	Institution	Lecture/Course
2022-2023	University of Rome Tor Vergata, Faculty of Medicine	Lecturer for the course "**Psicobiologia e Psicologia Fisiologica**" (9 ECTS)
2022-today	"Advanced School in AI". Institute of Cognitive Sciences and Technology (ISTC), National Research Council (CNR), Italy	Lecturer for the course "**Fundamentals of Neurobiology**"
2018-today	"Advanced School in AI". Institute of Cognitive Sciences and Technology (ISTC), National Research Council (CNR), Italy	Lecturer for the course "**Model-based data analysis**"
2012-2017	Ghent University (Belgium), Department of Experimental Psychology	Co-lecturer for the postgraduate course "**Modelling of Cognitive Processes**" (5 ECTS)

IVB – Supervising experience

Year	Institution	Role
2025	Sapienza University (Italy), Department of Psychology	Master thesis co-supervisor (relatore esterno laurea magistrale in Neuroscienze), Supervisor: Dr. Stefano Lasaponara, candidate: Berenice Ribezzo Doria
2025	University of Rome Tor Vergata, Faculty of Medicine	BS thesis supervisor (relatore laurea triennale in Psicologia), candidate: Martina Picarazzi
2025	University of Rome Tor Vergata, Faculty of Medicine	BS thesis supervisor (relatore laurea triennale in Psicologia), candidate: Chiara Melis
2023	Vrije Universiteit, Amsterdam, The Netherlands, Faculty of Science	Master thesis supervisor in Artificial Intelligence, candidate: Colette Wibaut
2021-2024	Dottorato Nazionale in Intelligenza Artificiale, agreement between CNR and University Campus Biomedico of Rome. Edition XXXVII	Supervisor PhD candidate Tim Vriens. Doctoral project: "Project Achlys: Applying Reinforcement Meta-Learning framework to precision medicine of major depressive disorder."
2020	Sapienza University (Italy), Department of Psychology	Master thesis supervisor (relatore laurea magitsrale in Neuroscienze), candidate: Marianna Lanza
2019-2022	Sapienza University (Italy), Department of Neuropsychiatry, Department of Psychology	Guidance counsellor for the doctoral project "Reinforcement Learning and ADHD pathophysiology" supervisor: Prof. Vincenzo Guidetti; candidate: Giulia Natalucci
2015-2016	Ghent University (Belgium), Department of Experimental Psychology	Supervisor for the internship thesis "The Impact of Non-Optimal Decision-Making on Addiction Predisposition: An EEG Time-Frequency Investigation." Candidate: Kate Ergo
2012-2016	Ghent University (Belgium), Department of Experimental Psychology	Guidance counsellor for the doctoral project "Dynamic adaptation of cognitive control" supervisor: Prof. Tom Verguts; candidate: Esther de Loof
2010-2014	Ghent University (Belgium), Department of Experimental Psychology	Guidance counsellor for the doctoral project "Reinforcement Learning in Higher Order Cognition" supervisor: Prof. Tom Verguts; candidate: Eliana Vassena

Part V - Society memberships, Awards and Honours

Year	Title
2010-today	Member of the Society for Neuroscience (SfN)
2004	Prize "Young Researcher", AIP (Italian Psychological Association) congress, section of Artificial Intelligence and Connectionist Models
2003	Ranked first in the competitive examination for the access to the PhD school, and funded by a 3-year grant. Sapienza University of Rome.

Part VI - Funding Information

Year	Title	Program	Grant value (Euro)
2023-2025	"Meta-learning-based decision-making in normality and depression: Combining large-scale computational modelling, functional neuroimaging and behavioural methods for a system-level perspective (MetaDeM)". **Role: P.I.**	PRIN 2022, Ministero dell'Università e della Ricerca, Grant N° 64. 20227MPSEH	257730
2021-2024	Funding for one PhD student at the National PhD Programme in AI. Project title:" Project Achlys: Application of the Meta-Reinforcement Learning framework to precision medicine of major depressive disorder." **Role: P.I.**	Dottorato Nazionale In Intelligenza Artificiale. Grant funded 50% of PhD cost by the CNR FOE, based on competitive selection.	32.000
2018-2020	Marie Sklodowska-Curie Individual Fellowship for the project: "Robotic embodiment of a meta-learning neural model of human decision-making." **Role: P.I.**	H2020, European Commission, Grant Agreement No. 795919	169.000
2017-2018	Grant for a visiting researcher role, project: "Embodiment of reinforcement learning neural model for cognitive control" **Role: Visiting researcher**	Flemish Research Foundation (FWO), Agreement No. V409517N	16.000

Part VII – Research Activities and responsibilities

VIIA – Research responsibilities

Year	Brief Description
2023-2025	P.I. of the project PRIN 2022:" Meta-learning-based decision-making in normality and depression: Combining large-scale computational modelling, functional neuroimaging and behavioural methods for a system-level perspective (MetaDeM)."

2020-today	Coordinator and co-founder of the Computational and Translational Neuroscience Laboratory (CTNLab), Institute of Cognitive Sciences and Technologies, National Research Council (ISTC-CNR) (https://ctnlab.it)
2020-today	P.I. of the CNR project:" Project Achlys: Application of the Meta-Reinforcement Learning framework to precision medicine of major depressive disorder."
2018-2020	P.I. of the H2020 project No. 795919:" Robotic embodiment of a meta-learning neural model of human decision-making"

VIIB – Basic research

Keywords	Brief Description
Neuroscience of Decision-making and Reinforcement Learning	Neural and computational basis of decision-making in the human brain. Methodology: computational modelling, neuroimaging, machine learning, behavioural
Neuroscience of visual attention/space representation	Neural and computational basis of visual attention in the human brain. Methodology: computational modelling, neuroimaging, machine learning, behavioural

VIIC – Translational research

Keywords	Brief Description
ADHD	Neural and behavioural pathophysiology of ADHD. Methodology: computational modelling, behavioural, pupillometry.
Major Depressive Disorder	Neural and behavioural pathophysiology of MDD. Methodology: computational modelling, behavioural, pupillometry, model-based fMRI

Part VIII – Summary of Scientific Achievements

Product type	Number	Database	Start	End
Journal articles [international, peer-rew]	36	Scopus	2005	2025
Book chapters [international, peer-rew]	3	Google Scholar	2005	2025

Metrics from **Scopus** (only journal articles)

Total Citations	1665
Average Citations per Product	46
Hirsch (H) index	21

Part IX– Selected Publications

List of 10 selected publications.

1. Vriens, T., Vassena, E., Pezzulo, G., Baldassarre, G., & **Silvetti, M.*** (2025). Meta-Reinforcement Learning reconciles surprise, value, and control in the anterior cingulate cortex. PLOS Computational Biology, 21(4), e1013025.

2. Terenzi, D., **Silvetti, M.**, Zoccolan, G., Rumiati, R. I., & Aiello, M. (2024). The impact of subclinical psychotic symptoms on delay and effort discounting: Insights from behavioral, computational, and electrophysiological methods. Schizophrenia Research, 271, 271-280.

3. **Silvetti, M*.**, Lasaponara, S., Daddaoua, N., Horan, M., & Gottlieb, J. (2023). A Reinforcement Meta-Learning framework of executive function and information demand. Neural Networks, 157, 103-113. IF(2022): 9.66

4. Doricchi, F., Lasaponara, S., Pazzaglia, M., & **Silvetti, M.** (2022). Left and right temporal-parietal junctions (TPJs) as "match/mismatch" hedonic machines: A unifying account of TPJ function. Physics of Life Reviews, 42, 56-92. IF(2022): 9.83

5. Caligiore, D., **Silvetti*, M.**, D'Amelio, M., Puglisi-Allegra, S., & Baldassarre, G. (2020). Computational modeling of catecholamines dysfunction in Alzheimer's Disease at pre-plaque stage. Journal of Alzheimer's Disease, (77)1, 275-290. IF(2020): 4.472

6. **Silvetti*, M.**, Vassena, E., Abrahamse, E., & Verguts, T. (2018). Dorsal anterior cingulate-brainstem ensemble as a reinforcement meta-learner. PLoS Computational Biology, 14(8), e1006370. IF(2018): 4.428

7. **Silvetti, M.**, Lasaponara, S., Lecce, F., Dragone, A., Macaluso, E., & Doricchi, F. (2016). The response of the left ventral attentional system to invalid targets and its implication for the spatial neglect syndrome: a multivariate fMRI investigation. Cerebral Cortex, 26(12), 4551-4562. IF(2016): 6.559

8. Verguts, T., Vassena, E., & **Silvetti, M.** (2015). Adaptive effort investment in cognitive and physical tasks: A neurocomputational model. Frontiers in Behavioral Neuroscience, 9, 57. IF(2015): 3.392

9. **Silvetti*, M.**, Alexander, W., Verguts, T., & Brown, J. W. (2014). From conflict management to reward-based decision making: actors and critics in primate medial frontal cortex. Neuroscience & Biobehavioral Reviews, 46, 44-57. IF(2014): 8.802

10. **Silvetti*, M.**, Wiersema, J. R., Sonuga-Barke, E., & Verguts, T. (2013). Deficient reinforcement learning in medial frontal cortex as a model of dopamine-related motivational deficits in ADHD. Neural Networks, *46*, 199-209. IF(2013): 2.076

***Corresponding author**

Part X– Invited Talks, meetings and symposia organization

XA – Invited talks

Year	Conference/seminar	Talk title
2022	Cognitive Control and Performance Monitoring (org. by ULB, CNRS, Aix-Marseille Université), Marseille, France	Bridging Meta-Learning and free energy principle to simulate cognitive control and information demand
2021	Dutch Neuroscience Meeting 2021	Modeling motivation under stress: the role of neurochemicals in effort-based decision-making
2021	Seminar at SIBIL (Seminario Interdisciplinare Bilaterale), University Roma 3 and Consiglio Nazionale delle Ricerche	Motivazioni e decisioni: una prospettiva di neuroscienze traslazionali
2019	Seminar at the Donders Institute for Brain, Cognition and Behaviour, Nijmegen, The Netherlands	Computer modeling of monoamine regulation for personalized psychiatry in depressive syndromes.
2018	7th International Conference of Spatial Cognition, Rome, Italy	Meta-learning foundations of (near) optimal cognitive control in the mammalian brain.
2018	Seminar at the Donders Institute for Brain, Cognition and Behaviour, Nijmegen, The Netherlands	Meta-Learning foundations of (near)optimal decision-making in the mammalian brain
2017	Seminar at the Institute of Cognitive Sciences and Technologies, National Research Council, Rome, Italy	Meta-learning foundations of cognitive control: A neuro-computational model
2017	Nederlandse Vereniging voor Psychonomie (NVP) winter conference 2017, Egmond aan Zee, The Netherlands	Meta-learning foundations of cognitive control
2015	Seminar at the Bell Labs, Alcatel Lucent, Antwerp, Belgium	Computational neuroscience of decision-making: Reverse engineering of the brain circuits for decision-making under uncertainty
2014	Annual meeting of the Italian Society of Neuropsychology (SINP), Naples, Italy	Interaction between mid-frontal cortex and midbrain provides an account for dopamine and norepinephrine dynamics
2014	Seminar at the International School for Advanced Studies (SISSA), Trieste, Italy	Actors and Critics in the primate mid-frontal cortex

2013	Symposium "Cognitive and Affective control (NoteCog2013)", Ghent University, Belgium	From conflict management to the economy of pleasure: Critical roles for primate medial frontal cortex
2013	Seminar for the "International Summer School on Social and Cognitive Neuroscience". International School for Advanced Studies (SISSA), Trieste, Italy	Reinforcement Learning and alimentary behaviour

XB – Symposia organization

Year	Conference/seminar	symposium title
2014	9th forum of the Federation of European Neuroscience Societies (FENS). July 5-9 2014, Milan, Italy	Chairman for the symposium "The hedonistic brain: learning, predicting and decision making"

Part XI– Editorial boards and peer reviewer activity

XIA – Membership to editorial boards

Year	Journal
2020-2022	Journal of Alzheimer's Disease
2017-today	Frontiers in Human Neuroscience

XIB – Peer reviewer activity for the following international journals

Nature Communications (ISSN: 2041-1723)
Neuropsychopharmacology (ISSN: 0893-133X)
Biological Psychiatry (ISSN:0006-3223)
Brain Structure and Function (ISSN:1863-2653)
Cognitive, affective & behavioral neuroscience (ISSN:1530-7026)
Cerebral cortex (ISSN:1047-3211)
Cognitive Neurodynamics (ISSN:1871-4080)
Cortex (ISSN:0010-9452)
Current neuropharmacology (ISSN:1570-159X)
Frontiers in Human Neuroscience (ISSN:1662-5161)
Neuroimage (ISSN:1053-81199
Neuropsychologia (ISSN:0028-3932)
Neuroscience and biobehavioral reviews (ISSN:0149-7634)
Neuroscience letters (ISSN:0304-3940)
PLoS One (ISSN:1932-6203)
Psychophysiology (ISSN:0048-5772)
Scientific Reports (ISSN:2045-2322)

Part XII– National and International Collaborations (currently active, excluding collaborations within my Institute)

Prof. Tom Verguts, *Ghent University (Belgium)*, on neural basis of decision-making and cognitive control
Prof. Fabrizio Doricchi, *Sapienza University (Italy)*, on neural basis of space representation and visual attention.
Prof. Vincenzo Guidetti, *Sapienza University (Italy)*, on pathophysiology of ADHD.

Dr. Eliana Vassena, *Dondenrs Institute for Brain, Cognition and Behaviour (The Netherlands)*, on cognitive and computational basis of catecholamine neuromodulation and effort-based decision-making.
Prof. Massimo Pasquini, *Sapienza University (Italy)*, on pathophysiology of Major Depressive Disorder.
Prof. Jaqueline Gottlieb, *Columbia University (USA)*, on neural basis of curiosity, intrinsic motivation and visual attention