

SCHEDA PER LA RACCOLTA DEL CURRICULUM SCIENTIFICO

Corso di Laurea: Processi Cognitivi e Tecnologie

Insegnamento/i: Reti Neurali e intelligenza artificiale II (id:5663), Sistemi Intelligenti (id:5370), Machine Learning (id:5592), Psicotecnologie e Processi Formativi 2 (id:5009).

Nome: Marco

Cognome: Breda

e-mail: marco.breda@uninettunouniversity.net

NOTA IMPORTANTE: ai sensi del D.M. 21/10/2007 n. 544, prima dell'avvio del corso UNINETTUNO deve pubblicare nella sezione del suo sito dedicata all'offerta formativa anche il **curriculum scientifico** del Docente/Tutor coinvolto.

Il **curriculum scientifico** deve contenere solo le informazioni del Docente/Tutor relative ai titoli conseguiti, alle sue produzioni e pubblicazioni scientifiche, all'attività didattica svolta e all'esperienza professionale posseduta.

Il **curriculum scientifico** non può contenere informazioni come: l'indirizzo di residenza, il codice fiscale, lo stato civile o altre informazioni familiari, il numero di telefono, gli indirizzi email e pec personali, le coordinate bancarie, la scansione della firma, o altri dati non pertinenti rispetto all'Offerta Formativa.

Il **curriculum vitae** redatto secondo il formato europeo o per la candidatura a concorsi o assunzioni non è conforme e **NON potrà essere pubblicato**.



Curriculum scientifico (in italiano)

Marco Breda è attualmente il Responsabile del Laboratorio di Ateneo sull'Intelligenza Artificiale dell'Università Telematica Internazionale UNINETTUNO; Università dove è anche Docente-tutor dei corsi Reti Neurali e intelligenza artificiale II(id:5663), Sistemi Intelligenti (id:5370), Machine Learning (id:5592), Psicotecnologie e Processi Formativi 2 (id:5009); nonché docente video nel corso Reti neurali.

Fino all'inizio del 2024 ha ricoperto il ruolo di Direttore dell'Area Advanced Analytics & AI presso il Data & Analytics Center of Excellence di Engineering Ingegneria Informatica, dove ha curato la progettazione e lo sviluppo di sistemi analitici complessi per aziende industriali pubbliche e private in diversi settori ICT utilizzando paradigmi di machine learning. Prima di entrare a far parte di Engineering nel 2009, dal 1998 ha lavorato come project manager specializzato in Data Warehousing, Business Intelligence e Data Mining per diverse aziende IT. In precedenza, a partire dal 1991, ha lavorato nella Divisione Ricerca di Ericsson Telecomunicazioni, occupandosi di Reti a Banda Larga e Sistemi Complessi. Dal 1990 ha collaborato anche con TIM progettando reti private avanzate per grandi utenti.

Parallelamente alla sua carriera professionale, dal 1997, è Ricercatore Associato presso il Centro di Ricerca Semeion, occupandosi principalmente di ricerca di base nell'ambito del Machine Learning e dell'Intelligenza Artificiale, risultando all'attivo di una cinquantina di pubblicazioni. Dal 2010 al 2024 è stato docente presso la Scuola "Enrico della Valle", dove

ha tenuto corsi di Data Warehousing e Advanced Analytics. Ha conseguito la laurea M.Sc, summa cum laude, in Ingegneria Elettronica presso l'Università "Sapienza" di Roma nel 1989.

Publications

- Garito, M. A., & Breda, M. (in press). Socrates AI: An ethical model of artificial intelligence for inclusive and personalized education. In M. E. Auer & D. May (Eds.), 2025 Yearbook on Emerging Technologies in Learning. Springer.
- Garito, M. A., & Breda, M. (in press). Dialogical AI: Socrates AI for social studies. In M. E. Auer & S. A. Nikou (Eds.), Generative AI in novel educational applications: Practices of integrating generative AI in the primary and secondary classroom (Vol. 2). Springer.
- Garito, M.A., Breda, M. (2025). Generative AI, a New Model for Knowledge Memorization. The Specific Case of the International Telematic University UNINETTUNO. In: Auer, M.E., May, D. (eds) 2024 Yearbook Emerging Technologies in Learning. Learning and Analytics in Intelligent Systems, vol 44. Springer, Cham. https://doi.org/10.1007/978-3-031-80388-8_5.
- Garito, M. A., & Breda, M. (2025). The ChatGPT Artificial Intelligence Model: Challenges and Solutions. In D. Brasioli, L. Guercio, G. G. Landini, & A. de Giorgio (Eds.), The Routledge Handbook of Artificial Intelligence and International Relations (pp. 294–303). Routledge. <https://doi.org/10.4324/9781003518495-28>. ISBN 978-1-032-85013-9 (hardcover), 978-1-032-85513-4 (paperback).
- Garito, M. A., & Breda, M. (2025). Generative AI, a new model for knowledge memorization: The specific case of the International Telematic University UNINETTUNO. In M. E. Auer & D. May (Eds.), 2024 Yearbook of Emerging Technologies in Learning (pp. 44–XX). Springer Cham. <https://doi.org/10.1007/978-3-031-80388-8>. ISBN 978-3-031-80387-1 (Hardcover), 978-3-031-80390-1 (Softcover), 978-3-031-80388-8 (eBook). Available at <https://link.springer.com/book/9783031803871>.
- Buscema, P. M., Lodwick, W. A., Massini, G., Sacco, P. L., Asadi-Zeydabadi, M., Newman, F., & Breda, M. (2025). AI: A Broad and a Different Perspective. Springer Cham. <https://doi.org/10.1007/978-3-031-80600-1>
- Buscema, P. M., Massini, G., Raimondi, G., Caporaso, G., Breda, M., & Petritoli, R. (2023). A Pattern Recognition Analysis of Vessel Trajectories. *Algorithms*, 16(9), 414.
- Buscema, M., Asadi-Zeydabadi, M., Massini, G., Lodwick, W. A., Breda, M., Petritoli, R., ... & Della Torre, F. (2023). The Topological Weighted Centroid: A New Vision of Geographic Profiling Theory and Applications.
- Buscema, P. M., Lodwick, W. A., Asadi-Zeydabadi, M., Newman, F., Breda, M., Petritoli, R., ... & Radicioni, F. (2023). Twisting Theory: A New Artificial Adaptive System for Landslide Prediction. *Geosciences*, 13(4), 115.
- Buscema, P. M., Della Torre, F., Breda, M., Massini, G., & Grossi, E. (2020). COVID-19 in Italy and extreme data mining. *Physica A: Statistical Mechanics and its Applications*, 124991.
- Buscema, P. M., Grossi, E., Massini, G., Breda, M., & Della Torre, F. (2020). Computer Aided Diagnosis for atrial fibrillation based on new artificial adaptive systems. *Computer Methods and Programs in Biomedicine*, 105401.
- Buscema, P. M., Sacco, P. L., Della Torre, F., Massini, G., Breda, M., & Ferilli, G. (2018). Theory of impossible worlds: Toward a physics of information. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 28(5), 055914.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Artificial Adaptive Systems Using Auto Contractive Maps: Theory, Applications and Extensions (Vol. 131). Springer.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Comparison of Auto-CM to Various Other Data Understanding Approaches. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 121-146). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Advances, the K-Contractive Map: A Supervised Version of Auto-CM. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 105-119). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Visualization of Auto-CM Output. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 61-76). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Auto-CM as a Dynamic Associative Memory. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 147-179). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Dataset Transformations and Auto-CM. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 77-104). Springer, Cham.
- Buscema, P. M., Massini, G., Fabrizi, M., Breda, M., & Della Torre, F. (2018). The ANNS approach to DEM reconstruction. *Computational Intelligence*, 34(1), 310-344.
- Buscema, M., Consonni, V., Ballabio, D., Mauri, A., Massini, G., Breda, M., & Todeschini, R. (2014). K-CM: A new artificial neural network. Application to supervised pattern recognition. *Chemometrics and Intelligent Laboratory Systems*, 138, 110-119.

- Buscema, M., Vernieri, F., Massini, G., Scarscia, F., Breda, M., Rossini, P. M., & Grossi, E. (2015). An improved I-FAST system for the diagnosis of Alzheimer's disease from unprocessed electroencephalograms by using robust invariant features. *Artificial intelligence in medicine*, 64(1), 59-74.
- Buscema, M., Asadi-Zeydabadi, M., Lodwick, W., & Breda, M. (2016). The H0 function, a new index for detecting structural/topological complexity information in undirected graphs. *Physica A: Statistical Mechanics and its Applications*, 447, 355-378.
- Buscema, M., Sacco, P. L., Ferilli, G., Breda, M., & Grossi, E. (2014). Analyzing the Semantics of Point Spaces through the Topological Weighted Centroid and Other Mathematical Quantities: The Hidden Geometry of the Global Economic Order. *Computational Intelligence*, 31(3), 532-567. doi:10.1111/coin.12040
- Buscema, M., Breda, M., & Lodwick, W. (2013). Training With Input Selection and Testing (TWIST) algorithm: a significant advance in pattern recognition performance of machine learning. *Journal of Intelligent Learning Systems and Applications*, 5(1), 29.
- Buscema, M., Ballabio, D., Consonni, V., Massini, G., Breda, M., Fabrizi, M., ... & Todeschini, R. (2013). K-contractive map (k-cm) for classification. In *VIII Colloquium Chemometricum Mediterraneum*.
- Buscema, M., Mancini, A., & Breda, M. (2013). Preprocessing Tools for Nonlinear Datasets. In *Intelligent Data Mining in Law Enforcement Analytics* (pp. 137-155). Springer, Dordrecht.
- Buscema, M., Breda, M., Grossi, E., Catzola, L., & Sacco, P. L. (2013). Semantics of point spaces through the Topological Weighted Centroid and other mathematical quantities: Theory and applications. In *Data Mining Applications Using Artificial Adaptive Systems* (pp. 75-139). Springer, New York, NY.
- Buscema, M., Breda, M., Grossi, E., Catzola, L., & Sacco, P. L. (2012). Semantics of Point Spaces through the Topological Weighted Centroid and Other Mathematical Quantities—Theory & Applications. Springer: New York, NY, USA.
- Buscema, M., Breda, M., & Catzola, G. (2009). The topological weighted centroid, and the semantic of the physical space—Theory. *Artificial adaptive systems in medicine*, 69-78.
- Buscema, M., Grossi, E., Breda, M., & Jefferson, T. (2009). Outbreaks source: A new mathematical approach to identify their possible location. *Physica A: Statistical Mechanics and its Applications*, 388(22), 4736-4762.
- Buscema, M., Breda, M., & Terzi, S. (2006, January). New Recurrent Neural Architectures. In *Proceedings of the 2006 WSEAS International Conference on Mathematical Biology and Ecology*, Miami, Florida, USA (pp. 174-201).
- Buscema, M., Breda, M., & Terzi, S. (2006, March). A feed forward sine based neural network for functional approximation of a waste incinerator emissions. In *Proceedings of the 8th WSEAS international conference on automatic control, modeling and simulation*, Prague.
- Buscema, P. M. E., Bottigli, U., Grossi, E., Breda, M., Catzola, L. (2006). Sistemi ACM e Imaging Diagnostico: le immagini mediche come Matrici Attive di Connessioni. Springer Science & Business Media.
- Buscema, M., Catzola, L., & Breda, M. (2006). Sistemi ACM a connessioni fisse. In *Sistemi ACM e Imaging Diagnostico* (pp. 21-35). Springer, Milano.
- Buscema, M., Terzi, S., & Breda, M. (2006). Using sinusoidal modulated weights improve feed-forward neural network performances in classification and functional approximation problems.. *WSEAS Transactions on information science and applications*, 3(5), 885-893.
- Buscema, M., Grossi, E., Intraligi, M., Garbagna, N., Andriulli, A., & Breda, M. (2005). An optimized experimental protocol based on neuro-evolutionary algorithms: application to the classification of dyspeptic patients and to the prediction of the effectiveness of their treatment. *Artificial Intelligence in Medicine*, 34(3), 279-305.
- Buscema, M., Breda, M., & Terzi, S. (2002). Complex recurrent networks: a new type of micro artificial organism. *Technical Paper*, (27).
- Buscema, M., Breda, M. (1999). Aspetti sulla convergenza di Reti Neurali Back-propagation. In Buscema, M., & Semeion Group. *Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni*. Angeli.
- Buscema, M., Breda, M. (1999). Reti Neurali Ricorrenti. In Buscema, M., & Semeion Group. *Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni*. Angeli.
- Buscema, M., Breda, M., & Terzi, S. (1999). Reti Neurali Autoriflessive. In Buscema, M., & Semeion Group. *Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni*. Angeli.
- Buscema, M., Breda, M. (1999). Self Organizing Maps. In Buscema, M., & Semeion Group. *Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni*. Angeli.
- Buscema, M. E., Breda M. (1998). Convergence aspects on Back-propagation Neural Networks. In *Artificial neural networks and complex social systems. I. Theory*. *Substance Use & Misuse*, 33(1), v-xvii.

Curriculum scientifico (in inglese)

Marco Breda is currently the Head of the University Laboratory on Artificial Intelligence of the International Telematic University UNINETTUNO; University where he is also a lecturer-tutor of the courses Neural Networks and Artificial Intelligence II (id:5663), Intelligent Systems (id:5370), Machine Learning (id:5592), Psychotechnologies and Training Processes 2 (id:5009); as well as video teacher in the course Neural networks.

Until the beginning of 2024, he held the position of Director of the Advanced Analytics & AI Area at the Data & Analytics Center of Excellence of Engineering Ingegneria Informatica, where he oversaw the design and development of complex analytical systems for public and private industrial companies in different ICT sectors using machine learning paradigms. Before joining Engineering in 2009, he worked as a project manager specializing in Data Warehousing, Business Intelligence and Data Mining for various IT companies since 1998. Previously, starting in 1991, he worked in the Research Division of Ericsson Telecommunications, dealing with Broadband Networks and Complex Systems. Since 1990 he has also collaborated with TIM designing advanced private networks for large users.

In parallel with his professional career, since 1997, he has been an Associate Researcher at the Semeion Research Center, mainly dealing with basic research in the field of Machine Learning and Artificial Intelligence, resulting in about fifty publications. From 2010 to 2024 he was a lecturer at the "Enrico della Valle" School, where he taught courses in Data Warehousing and Advanced Analytics. He received his M.Sc degree, summa laude, in Electronic Engineering from the "Sapienza" University of Rome in 1989.

Publications

- Garito, M. A., & Breda, M. (in press). Socrates AI: An ethical model of artificial intelligence for inclusive and personalized education. In M. E. Auer & D. May (Eds.), 2025 Yearbook on Emerging Technologies in Learning. Springer.
- Garito, M. A., & Breda, M. (in press). Dialogical AI: Socrates AI for social studies. In M. E. Auer & S. A. Nikou (Eds.), Generative AI in novel educational applications: Practices of integrating generative AI in the primary and secondary classroom (Vol. 2). Springer.
- Garito, M.A., Breda, M. (2025). Generative AI, a New Model for Knowledge Memorization. The Specific Case of the International Telematic University UNINETTUNO. In: Auer, M.E., May, D. (eds) 2024 Yearbook Emerging Technologies in Learning. Learning and Analytics in Intelligent Systems, vol 44. Springer, Cham. https://doi.org/10.1007/978-3-031-80388-8_5.
- Garito, M. A., & Breda, M. (2025). The ChatGPT Artificial Intelligence Model: Challenges and Solutions. In D. Brasioli, L. Guercio, G. G. Landini, & A. de Giorgio (Eds.), The Routledge Handbook of Artificial Intelligence and International Relations (pp. 294–303). Routledge. <https://doi.org/10.4324/9781003518495-28>. ISBN 978-1-032-85013-9 (hardcover), 978-1-032-85513-4 (paperback).
- Garito, M. A., & Breda, M. (2025). Generative AI, a new model for knowledge memorization: The specific case of the International Telematic University UNINETTUNO. In M. E. Auer & D. May (Eds.), 2024 Yearbook of Emerging Technologies in Learning (pp. 44–XX). Springer Cham. <https://doi.org/10.1007/978-3-031-80388-8>. ISBN 978-3-031-80387-1 (Hardcover), 978-3-031-80390-1 (Softcover), 978-3-031-80388-8 (eBook). Available at <https://link.springer.com/book/9783031803871>.
- Buscema, P. M., Lodwick, W. A., Massini, G., Sacco, P. L., Asadi-Zeydabadi, M., Newman, F., & Breda, M. (2025). AI: A Broad and a Different Perspective. Springer Cham. <https://doi.org/10.1007/978-3-031-80600-1>
- Buscema, P. M., Massini, G., Raimondi, G., Caporaso, G., Breda, M., & Petritoli, R. (2023). A Pattern Recognition Analysis of Vessel Trajectories. Algorithms, 16(9), 414.
- Buscema, M., Asadi-Zeydabadi, M., Massini, G., Lodwick, W. A., Breda, M., Petritoli, R., ... & Della Torre, F. (2023). The Topological Weighted Centroid: A New Vision of Geographic Profiling Theory and Applications.
- Buscema, P. M., Lodwick, W. A., Asadi-Zeydabadi, M., Newman, F., Breda, M., Petritoli, R., ... & Radicioni, F. (2023). Twisting Theory: A New Artificial Adaptive System for Landslide Prediction. Geosciences, 13(4), 115.
- Buscema, P. M., Della Torre, F., Breda, M., Massini, G., & Grossi, E. (2020). COVID-19 in Italy and extreme data mining. Physica A: Statistical Mechanics and its Applications, 124991.
- Buscema, P. M., Grossi, E., Massini, G., Breda, M., & Della Torre, F. (2020). Computer Aided Diagnosis for atrial fibrillation based on new artificial adaptive systems. Computer Methods and Programs in Biomedicine, 105401.
- Buscema, P. M., Sacco, P. L., Della Torre, F., Massini, G., Breda, M., & Ferilli, G. (2018). Theory of impossible worlds: Toward a physics of information. Chaos: An Interdisciplinary Journal of Nonlinear Science, 28(5), 055914.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Artificial Adaptive Systems Using Auto Contractive Maps: Theory, Applications and Extensions (Vol. 131). Springer.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Comparison of Auto-CM to Various Other Data Understanding Approaches. In Artificial Adaptive Systems Using Auto Contractive Maps (pp. 121-146). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Advances, the K-Contractive Map: A Supervised Version of Auto-CM. In Artificial Adaptive Systems Using Auto Contractive Maps (pp. 105-119). Springer, Cham.

- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Visualization of Auto-CM Output. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 61-76). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Auto-CM as a Dynamic Associative Memory. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 147-179). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Dataset Transformations and Auto-CM. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 77-104). Springer, Cham.
- Buscema, P. M., Massini, G., Fabrizi, M., Breda, M., & Della Torre, F. (2018). The ANNS approach to DEM reconstruction. *Computational Intelligence*, 34(1), 310-344.
- Buscema, M., Consonni, V., Ballabio, D., Mauri, A., Massini, G., Breda, M., & Todeschini, R. (2014). K-CM: A new artificial neural network. Application to supervised pattern recognition. *Chemometrics and Intelligent Laboratory Systems*, 138, 110-119.
- Buscema, M., Vernieri, F., Massini, G., Scarscia, F., Breda, M., Rossini, P. M., & Grossi, E. (2015). An improved I-FAST system for the diagnosis of Alzheimer's disease from unprocessed electroencephalograms by using robust invariant features. *Artificial intelligence in medicine*, 64(1), 59-74.
- Buscema, M., Asadi-Zeydabadi, M., Lodwick, W., & Breda, M. (2016). The H0 function, a new index for detecting structural/topological complexity information in undirected graphs. *Physica A: Statistical Mechanics and its Applications*, 447, 355-378.
- Buscema, M., Sacco, P. L., Ferilli, G., Breda, M., & Grossi, E. (2014). Analyzing the Semantics of Point Spaces through the Topological Weighted Centroid and Other Mathematical Quantities: The Hidden Geometry of the Global Economic Order. *Computational Intelligence*, 31(3), 532-567. doi:10.1111/coin.12040
- Buscema, M., Breda, M., & Lodwick, W. (2013). Training With Input Selection and Testing (TWIST) algorithm: a significant advance in pattern recognition performance of machine learning. *Journal of Intelligent Learning Systems and Applications*, 5(1), 29.
- Buscema, M., Ballabio, D., Consonni, V., Massini, G., Breda, M., Fabrizi, M., ... & Todeschini, R. (2013). K-contractive map (k-cm) for classification. In *VIII Colloquium Chemometricum Mediterraneum*.
- Buscema, M., Mancini, A., & Breda, M. (2013). Preprocessing Tools for Nonlinear Datasets. In *Intelligent Data Mining in Law Enforcement Analytics* (pp. 137-155). Springer, Dordrecht.
- Buscema, M., Breda, M., Grossi, E., Catzola, L., & Sacco, P. L. (2013). Semantics of point spaces through the Topological Weighted Centroid and other mathematical quantities: Theory and applications. In *Data Mining Applications Using Artificial Adaptive Systems* (pp. 75-139). Springer, New York, NY.
- Buscema, M., Breda, M., Grossi, E., Catzola, L., & Sacco, P. L. (2012). Semantics of Point Spaces through the Topological Weighted Centroid and Other Mathematical Quantities—Theory & Applications. Springer: New York, NY, USA.
- Buscema, M., Breda, M., & Catzola, G. (2009). The topological weighted centroid, and the semantic of the physical space—Theory. *Artificial adaptive systems in medicine*, 69-78.
- Buscema, M., Grossi, E., Breda, M., & Jefferson, T. (2009). Outbreaks source: A new mathematical approach to identify their possible location. *Physica A: Statistical Mechanics and its Applications*, 388(22), 4736-4762.
- Buscema, M., Breda, M., & Terzi, S. (2006, January). New Recurrent Neural Architectures. In *Proceedings of the 2006 WSEAS International Conference on Mathematical Biology and Ecology*, Miami, Florida, USA (pp. 174-201).
- Buscema, M., Breda, M., & Terzi, S. (2006, March). A feed forward sine based neural network for functional approximation of a waste incinerator emissions. In *Proceedings of the 8th WSEAS international conference on automatic control, modeling and simulation*, Prague.
- Buscema, P. M. E., Bottigli, U., Grossi, E., Breda, M., Catzola, L. (2006). Sistemi ACM e Imaging Diagnostico: le immagini mediche come Matrici Attive di Connessioni. Springer Science & Business Media.
- Buscema, M., Catzola, L., & Breda, M. (2006). Sistemi ACM a connessioni fisse. In *Sistemi ACM e Imaging Diagnostico* (pp. 21-35). Springer, Milano.
- Buscema, M., Terzi, S., & Breda, M. (2006). Using sinusoidal modulated weights improve feed-forward neural network performances in classification and functional approximation problems.. *WSEAS Transactions on information science and applications*, 3(5), 885-893.
- Buscema, M., Grossi, E., Intraligi, M., Garbagna, N., Andriulli, A., & Breda, M. (2005). An optimized experimental protocol based on neuro-evolutionary algorithms: application to the classification of dyspeptic patients and to the prediction of the effectiveness of their treatment. *Artificial Intelligence in Medicine*, 34(3), 279-305.
- Buscema, M., Breda, M., & Terzi, S. (2002). Complex recurrent networks: a new type of micro artificial organism. *Technical Paper*, (27).
- Buscema, M., Breda, M. (1999). Aspetti sulla convergenza di Reti Neurali Back-propagation. In *Buscema, M., & Semeion Group. Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni*. Angeli.

- Buscema, M., Breda, M. (1999). Reti Neurali Ricorrenti. In Buscema, M., & Semeion Group. Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni. Angeli.
- Buscema, M., Breda, M., & Terzi, S. (1999). Reti Neurali Autoriflessive. In Buscema, M., & Semeion Group. Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni. Angeli.
- Buscema, M., Breda, M. (1999). Self Organizing Maps. In Buscema, M., & Semeion Group. Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni. Angeli.
- Buscema, M. E., Breda M. (1998). Convergence aspects on Back-propagation Neural Networks. In Artificial neural networks and complex social systems. I. Theory. Substance Use & Misuse, 33(1), v-xvii.

Curriculum scientifico (in francese)

Marco Breda est actuellement chef du laboratoire universitaire d'intelligence artificielle de l'Université télématique internationale UNINETTUNO ; Université où il est également chargé de cours, Réseaux neuronaux et intelligence artificielle II (id :5663), Systèmes intelligents (id :5370), Apprentissage automatique (id :5592), Psychotechnologies et processus de formation 2 (id :5009) ; ainsi que professeur vidéo dans le cours Réseaux de neurones.

Jusqu'au début de 2024, il a occupé le poste de directeur de la zone Advanced Analytics & AI au Data & Analytics Center of Excellence of Engineering Ingegneria Informatica, où il supervisait la conception et le développement de systèmes analytiques complexes pour des entreprises industrielles publiques et privées dans différents secteurs TIC utilisant des paradigmes d'apprentissage automatique. Avant de rejoindre l'ingénierie en 2009, il a travaillé comme chef de projet spécialisé en entreposage de données, intelligence économique et exploration de données pour diverses entreprises informatiques depuis 1998. Auparavant, à partir de 1991, il a travaillé dans la division de recherche d'Ericsson Telecommunications, s'occupant des réseaux haut débit et des systèmes complexes. Depuis 1990, il collabore également avec TIM pour concevoir des réseaux privés avancés destinés aux grands utilisateurs.

Parallèlement à sa carrière professionnelle, depuis 1997, il est chercheur associé au Centre de recherche Semeion, se consacrant principalement à la recherche fondamentale dans le domaine de l'apprentissage automatique et de l'intelligence artificielle, ce qui a donné lieu à environ cinquante publications. De 2010 à 2024, il a été chargé de cours à l'école « Enrico della Valle », où il a enseigné des cours en entreposage de données et analytique avancée. Il a obtenu son diplôme de M.Sc, summa laude, en génie électronique à l'Université « Sapienza » de Rome en 1989.

Publications

- Garito, M. A., & Breda, M. (in press). Socrates AI: An ethical model of artificial intelligence for inclusive and personalized education. In M. E. Auer & D. May (Eds.), 2025 Yearbook on Emerging Technologies in Learning. Springer.
- Garito, M. A., & Breda, M. (in press). Dialogical AI: Socrates AI for social studies. In M. E. Auer & S. A. Nikou (Eds.), Generative AI in novel educational applications: Practices of integrating generative AI in the primary and secondary classroom (Vol. 2). Springer.
- Garito, M.A., Breda, M. (2025). Generative AI, a New Model for Knowledge Memorization. The Specific Case of the International Telematic University UNINETTUNO. In: Auer, M.E., May, D. (eds) 2024 Yearbook Emerging Technologies in Learning. Learning and Analytics in Intelligent Systems, vol 44. Springer, Cham. https://doi.org/10.1007/978-3-031-80388-8_5.
- Garito, M. A., & Breda, M. (2025). The ChatGPT Artificial Intelligence Model: Challenges and Solutions. In D. Brasioli, L. Guercio, G. G. Landini, & A. de Giorgio (Eds.), The Routledge Handbook of Artificial Intelligence and International Relations (pp. 294-303). Routledge. <https://doi.org/10.4324/9781003518495-28>. ISBN 978-1-032-85013-9 (hardcover), 978-1-032-85513-4 (paperback).
- Garito, M. A., & Breda, M. (2025). Generative AI, a new model for knowledge memorization: The specific case of the International Telematic University UNINETTUNO. In M. E. Auer & D. May (Eds.), 2024 Yearbook of Emerging Technologies in Learning (pp. 44-XX). Springer Cham. <https://doi.org/10.1007/978-3-031-80388-8>. ISBN 978-3-031-80387-1 (Hardcover), 978-3-031-80390-1 (Softcover), 978-3-031-80388-8 (eBook). Available at <https://link.springer.com/book/9783031803871>.
- Buscema, P. M., Lodwick, W. A., Massini, G., Sacco, P. L., Asadi-Zeydabadi, M., Newman, F., & Breda, M. (2025). AI: A Broad and a Different Perspective. Springer Cham. <https://doi.org/10.1007/978-3-031-80600-1>
- Buscema, P. M., Massini, G., Raimondi, G., Caporaso, G., Breda, M., & Petritoli, R. (2023). A Pattern Recognition Analysis of Vessel Trajectories. Algorithms, 16(9), 414.
- Buscema, M., Asadi-Zeydabadi, M., Massini, G., Lodwick, W. A., Breda, M., Petritoli, R., ... & Della Torre, F. (2023). The Topological Weighted Centroid: A New Vision of Geographic Profiling Theory and Applications.

- Buscema, P. M., Lodwick, W. A., Asadi-Zeydabadi, M., Newman, F., Breda, M., Petritoli, R., ... & Radicioni, F. (2023). Twisting Theory: A New Artificial Adaptive System for Landslide Prediction. *Geosciences*, 13(4), 115.
- Buscema, P. M., Della Torre, F., Breda, M., Massini, G., & Grossi, E. (2020). COVID-19 in Italy and extreme data mining. *Physica A: Statistical Mechanics and its Applications*, 124991.
- Buscema, P. M., Grossi, E., Massini, G., Breda, M., & Della Torre, F. (2020). Computer Aided Diagnosis for atrial fibrillation based on new artificial adaptive systems. *Computer Methods and Programs in Biomedicine*, 105401.
- Buscema, P. M., Sacco, P. L., Della Torre, F., Massini, G., Breda, M., & Ferilli, G. (2018). Theory of impossible worlds: Toward a physics of information. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 28(5), 055914.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Artificial Adaptive Systems Using Auto Contractive Maps: Theory, Applications and Extensions (Vol. 131). Springer.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Comparison of Auto-CM to Various Other Data Understanding Approaches. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 121-146). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Advances, the K-Contractive Map: A Supervised Version of Auto-CM. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 105-119). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Visualization of Auto-CM Output. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 61-76). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Auto-CM as a Dynamic Associative Memory. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 147-179). Springer, Cham.
- Buscema, P. M., Massini, G., Breda, M., Lodwick, W. A., Newman, F., & Asadi-Zeydabadi, M. (2018). Dataset Transformations and Auto-CM. In *Artificial Adaptive Systems Using Auto Contractive Maps* (pp. 77-104). Springer, Cham.
- Buscema, P. M., Massini, G., Fabrizi, M., Breda, M., & Della Torre, F. (2018). The ANNS approach to DEM reconstruction. *Computational Intelligence*, 34(1), 310-344.
- Buscema, M., Consonni, V., Ballabio, D., Mauri, A., Massini, G., Breda, M., & Todeschini, R. (2014). K-CM: A new artificial neural network. Application to supervised pattern recognition. *Chemometrics and Intelligent Laboratory Systems*, 138, 110-119.
- Buscema, M., Vernieri, F., Massini, G., Scarscia, F., Breda, M., Rossini, P. M., & Grossi, E. (2015). An improved I-FAST system for the diagnosis of Alzheimer's disease from unprocessed electroencephalograms by using robust invariant features. *Artificial intelligence in medicine*, 64(1), 59-74.
- Buscema, M., Asadi-Zeydabadi, M., Lodwick, W., & Breda, M. (2016). The H0 function, a new index for detecting structural/topological complexity information in undirected graphs. *Physica A: Statistical Mechanics and its Applications*, 447, 355-378.
- Buscema, M., Sacco, P. L., Ferilli, G., Breda, M., & Grossi, E. (2014). Analyzing the Semantics of Point Spaces through the Topological Weighted Centroid and Other Mathematical Quantities: The Hidden Geometry of the Global Economic Order. *Computational Intelligence*, 31(3), 532-567. doi:10.1111/coin.12040
- Buscema, M., Breda, M., & Lodwick, W. (2013). Training With Input Selection and Testing (TWIST) algorithm: a significant advance in pattern recognition performance of machine learning. *Journal of Intelligent Learning Systems and Applications*, 5(1), 29.
- Buscema, M., Ballabio, D., Consonni, V., Massini, G., Breda, M., Fabrizi, M., ... & Todeschini, R. (2013). K-contractive map (k-cm) for classification. In *VIII Colloquium Chemometricum Mediterraneum*.
- Buscema, M., Mancini, A., & Breda, M. (2013). Preprocessing Tools for Nonlinear Datasets. In *Intelligent Data Mining in Law Enforcement Analytics* (pp. 137-155). Springer, Dordrecht.
- Buscema, M., Breda, M., Grossi, E., Catzola, L., & Sacco, P. L. (2013). Semantics of point spaces through the Topological Weighted Centroid and other mathematical quantities: Theory and applications. In *Data Mining Applications Using Artificial Adaptive Systems* (pp. 75-139). Springer, New York, NY.
- Buscema, M., Breda, M., Grossi, E., Catzola, L., & Sacco, P. L. (2012). Semantics of Point Spaces through the Topological Weighted Centroid and Other Mathematical Quantities—Theory & Applications. Springer: New York, NY, USA.
- Buscema, M., Breda, M., & Catzola, G. (2009). The topological weighted centroid, and the semantic of the physical space—Theory. *Artificial adaptive systems in medicine*, 69-78.
- Buscema, M., Grossi, E., Breda, M., & Jefferson, T. (2009). Outbreaks source: A new mathematical approach to identify their possible location. *Physica A: Statistical Mechanics and its Applications*, 388(22), 4736-4762.
- Buscema, M., Breda, M., & Terzi, S. (2006, January). New Recurrent Neural Architectures. In *Proceedings of the 2006 WSEAS International Conference on Mathematical Biology and Ecology*, Miami, Florida, USA (pp. 174-201).

- Buscema, M., Breda, M., & Terzi, S. (2006, March). A feed forward sine based neural network for functional approximation of a waste incinerator emissions. In Proceedings of the 8th WSEAS international conference on automatic control, modeling and simulation, Prague.
- Buscema, P. M. E., Bottigli, U., Grossi, E., Breda, M., Catzola, L. (2006). Sistemi ACM e Imaging Diagnostico: le immagini mediche come Matrici Attive di Connessioni. Springer Science & Business Media.
- Buscema, M., Catzola, L., & Breda, M. (2006). Sistemi ACM a connessioni fisse. In Sistemi ACM e Imaging Diagnostico (pp. 21-35). Springer, Milano.
- Buscema, M., Terzi, S., & Breda, M. (2006). Using sinusoidal modulated weights improve feed-forward neural network performances in classification and functional approximation problems.. WSEAS Transactions on information science and applications, 3(5), 885-893.
- Buscema, M., Grossi, E., Intraligi, M., Garbagna, N., Andriulli, A., & Breda, M. (2005). An optimized experimental protocol based on neuro-evolutionary algorithms: application to the classification of dyspeptic patients and to the prediction of the effectiveness of their treatment. Artificial Intelligence in Medicine, 34(3), 279-305.
- Buscema, M., Breda, M., & Terzi, S. (2002). Complex recurrent networks: a new type of micro artificial organism. Technical Paper, (27).
- Buscema, M., Breda, M. (1999). Aspetti sulla convergenza di Reti Neurali Back-propagation. In Buscema, M., & Semeion Group. Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni. Angeli.
- Buscema, M., Breda, M. (1999). Reti Neurali Ricorrenti. In Buscema, M., & Semeion Group. Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni. Angeli.
- Buscema, M., Breda, M., & Terzi, S. (1999). Reti Neurali Autoriflessive. In Buscema, M., & Semeion Group. Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni. Angeli.
- Buscema, M., Breda, M. (1999). Self Organizing Maps. In Buscema, M., & Semeion Group. Reti neurali artificiali e sistemi sociali complessi: teoria, modelli, applicazioni. Angeli.
- Buscema, M. E., Breda M. (1998). Convergence aspects on Back-propagation Neural Networks. In Artificial neural networks and complex social systems. I. Theory. Substance Use & Misuse, 33(1), v-xvii.

Ai sensi del D. L.gvo del 30 giugno 2003, n. 196 (Codice in materia di protezione dei dati personali), informato delle finalità del trattamento dei dati e della loro registrazione su supporti informatici, nonché dei soggetti responsabili dello stesso,

AUTORIZZO

con la trasmissione di questa scheda, UNINETTUNO Università Telematica nella figura del Rettore prof. Maria Amata Garito al trattamento dei dati personali contenuti in questo modulo per esclusive finalità didattiche e di ricerca al fine di consentire lo svolgimento dell'insegnamento e delle pratiche amministrative collegate.