Curriculum Vitae

EDUCATION

2019 – 2020   Second level short specialization degree in "**Machine learning and big data in precision medicine and biomedical research**". University of Padova, Italy. Grade: Ottimo (4/4).

2019   State examination qualifying for the profession of psychologist. I Session 2019.

2016-2018   **MCs in "Neuroscience and Neuropsychological Rehabilitation"**, University of Bologna, Italy. Grade: 108/110.

2012-2015   **BCs in Psychology**, University of Bologna, Italy. Grade: 108/110

2006-2011   High-school graduation in Scientific filed, "E.Mattei", Italy.

TRAINING AND COURSES

2022   **"Applied Reinforcement Learning"** (2 ECTS). ZHAW Life Sciences and Facility Management, Zürich, Campus Zentrum, Lagerstrasse 41 (online). 26 August – 30 September 2022

2021   **XXXV Conference on Neural Information Processing Systems (NeurIPS) (online).** 6-14 December 2021.

2021   **Computational Psychiatry Course (online)**. Held by the Translational Neuromodeling Unit (TNU), University of Zurich & ETH Zurich. 13-18 September 2021.

2021   **3rd International Summer School on Artificial Intelligence and Games (online).** Held by modl.ai in partnership with Unity, DeepMind, and Creative Assembly. 5-9 July 2021.

2021   **Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning.** Coursera Course Certificate. Credential ID: V97344VESXVA. https://www.coursera.org/account/accomplishments/certificate/V97344VESXVA

2020   **Explainable Machine Learning with LIME and H2O in R**. Coursera Course Certificate. Credential ID: 5SVQCD9QWWTN. https://www.coursera.org/account/accomplishments/certificate/5SVQCD9QWWTN

2020   **Applied Data Science Specialization**, Coursera Course Certificate. Credential ID: X5U7E6U3FQPB. https://www.coursera.org/account/accomplishments/specialization/certificate/X5U7E6U3FQPB

2020   Think Open Rovereto workshop, University of Trento/CiMec, Italy.

2019   Symposium in honor of Prof. Bolzani, "Open Statistics: Methods and Thinking in Psychological Research". Department of Psychology, University of Bologna (Cesena, Italy).

2019   Lectio Magistralis in "Statistical Learning with Big Data" given by Prof. Trevor Hastie, University of Bologna, Bologna, Italy.

2019   "50th European Mathematical Psychology Group Meeting (EMPG), University of Heidelberg, Heidelberg, Germany.

2018-2019   Professionalising internship:

- 04/2018 – 10/2018 "Gli Amici di Luca" Association, Casa dei Risvegli Luca De Nigris, Bologna, Italy (500 hours). Under the supervision of Prof. Di Sant'Antonio Anna.
- 10/2018 – 04/2019 University of Bologna, Cesena, Italy (500 hours). Under the supervision of Prof. Giovagnoli Sara.

2018   Conference: "Possibility and limits of the return to drive after acquired brain injuries" 20° National day of awakenings for coma research, "Gli Amici di Luca" Association, Bologna, Italy.

2018   XI National conference in Psychology of Aging, SIPI, Catholic university of the Sacred Hearth, Milan, Italy.

2017   Advanced training course in: "Integrated neuropsychological Diagnosis in adult and senior". "Spazio Iris" Association, Milan, Italy.

PEER-REVIEWED PUBLICATIONS

Print

1. Benassi M., Garofalo S., Ambrosini F., Sant'Angelo R.P., Raggini R., De Paoli G., Ravani C., Giovagnoli S., **Orsoni M**., and Giovanni Piraccini. Using Two-Step cluster analysis and Latent Class Analysis to classify the cognitive heterogeneity of cross-diagnostic psychiatric inpatients. *Frontiers in Psychology*, section Quantitative Psychology and Measurement. doi: 10.3389/fpsyg.2020.01085

2. Spinoso M., Novelli C., Giovagnoli, S., Magri, S., Vetere, F., **Orsoni M**., Lunghi, V., Bertani, S., Bartolini, L., Benassi M. Uno studio preliminare di validazione di Attento alle parole!. (2021) *Logopedia e comunicazione*. doi: 10.14605/LOG1712110

3. Fini, C., Zannino, G. D., **Orsoni, M**., Carlesimo, G. A., Benassi, M., & Borghi, A. M. (2022). Articulatory suppression delays processing of abstract words: The role of inner speech. *Quarterly Journal of Experimental Psychology*, 75(7), 1343-1354. https://doi.org/10.1177/17470218211053623

4. Villani, C., **Orsoni, M**., Lugli, L., Benassi, M., & Borghi, A. M. (2022). Abstract and concrete concepts in conversation. *Scientific Reports*, 12(1), 17572. https://doi.org/10.1038/s41598-022-20785-5

5. Garofalo S., Giovagnoli S., **Orsoni M.**, Starita F., Benassi M (2022) Interaction effect: Are you doing the right thing?. *PLOS ONE* 17(7): e0271668. https://doi.org/10.1371/journal.pone.0271668

6. **Orsoni, M**., Giovagnoli, S., Garofalo, S., Magri, S., Benvenuti, M., Mazzoni, E., & Benassi, M. (2023). Preliminary evidence on machine learning approaches for clusterizing students' cognitive profile. *Heliyon*, 9(3), e14506. https://doi.org/10.1016/j.heliyon.2023.e14506

7. **Orsoni, M**., Pögelt, A., Duong-Trung, N., Benassi, M., Kravcik, M., Grüttmüller, M. (2023). Recommending Mathematical Tasks Based on Reinforcement Learning and Item Response Theory. In: Frasson, C., Mylonas, P., Troussas, C. (eds) Augmented Intelligence and Intelligent Tutoring Systems. ITS 2023. *Lecture Notes in Computer Science*, vol 13891. Springer, Cham. https://doi.org/10.1007/978-3-031-32883-1_2

8. Benvenuti, M., Cangelosi, A., Weinberger, A., Mazzoni, E., Benassi, M., Barbaresi, M., & **Orsoni, M.** (2023). Artificial intelligence and human behavioral development: A perspective on new skills and competences acquisition for the educational context. *Computers in Human Behavior*, 148, 107903. https://doi.org/10.1016/j.chb.2023.107903

9. **Orsoni, M.,** Dubé, A., Prandi, C., Giovagnoli, S., Benassi, M., Mazzoni, E., & Benvenuti, M. (2023). Learning Landscape in Gamification: The Need for a Methodological Protocol in Research Applications. *Perspectives on Psychological Science*, 0(0). https://doi.org/10.1177/17456916231202489

10. de Chiusole, D.; Spinoso, M.; Anselmi, P.; Bacherini, A.; Balboni, G.; Mazzoni, N.; Brancaccio, A.; Epifania, O.M.; Orsoni, M.; Giovagnoli, S.; et al. PsycAssist: A Web-Based Artificial Intelligence System Designed for Adaptive Neuropsychological Assessment and Training. *Brain Sci.* 2024, *14*, 122. https://doi.org/10.3390/brainsci14020122

In Preparation

1. Garofalo S., Benassi M., Giovagnoli S., **Orsoni M.**, Dal Col S., and Ruscelli C. Eye Movements Disorders in Psychiatric Patients: a meta-analysis. https://osf.io/g4wvf
2. **Orsoni M**., Benassi M., & Scutari M. Information Theory, Machine Learning, and Bayesian Networks in the Analysis of Dichotomous and Likert Responses for Questionnaire Psychometric Validation.
3. **Orsoni M.**, Giovagnoli S., Garofalo S., Benassi M. Unlocking Cognitive Patterns: A Comparative Exploration of Linear and Deep Dimensionality Reduction Approaches in clusterizing Student Cognitive Profiling.

BOOK CHAPTERS

1. Elvis Mazzoni, Martina Benvenuti, **Matteo Orsoni**, *Robotica e tecnologie per lo sviluppo: come costruire le competenze del futuro*, in: La societá dei Robot, Milano, Mondadori Education, Mondadori Universitá, 2022, pp. 215 - 226 [capitolo di libro]

CONFERENCES PRESENTATION – TALK

2023	19th International Conference on Intelligent Tutoring Systems «Augmented Intelligence and ITS». Corfu, Greece, 2-5 June 2023. "Recommending Mathematical Tasks Based on Reinforcement Learning and Item Response Theory". **Matteo Orsoni**, *Alexander Pögelt, Nghia Duong-Trung, Mariagrazia Benassi, Milos Kravcik, and Martin Grüttmüller*
2023	European Congress of Methodology organized by the European Association of Methodology (EAM), University of Ghent, Belgium, 11-14 July 2023. "Improving Questionnaire Efficiency: A Bayesian Networks, Jensen-Shannon, and Machine Learning Approach for Selecting Relevant Items and Assessing Symptomatology Risk". **Matteo Orsoni**, *Marco Scutari, Luca Tarasi, Sara Giovagnoli, Vincenzo Romei, Mariagrazia Benassi.*
2022	European Mathematical Psychology Group (EMPG), University of Trento: "Bayesian Networks and Jensen-Shannon divergence for item selection". **Orsoni Matteo.**, *Scutari Marco., Tarasi Luca., Romei Vincenzo., Benassi Mariagrazia.*
2022	International Meeting of the Psychometric Society (IMPS): "Unsupervised and supervised learning algorithms for accurate classification of cognitive profiles". **Orsoni Matteo.**, *Garofalo, Sara., Giovagnoli Sara., Benassi Mariagrazia.* Symposium: Advanced methods to explore individual differences.
2021	XXIII Congresso Nazionale Associazione Italiana di Psicologia, Sezione di Psicologia dello Sviluppo e dell'Educazione: "Robotica e tecnologie dello sviluppo: come iniziare a costruire le competenze del XXI secolo a partire dalla scuola dell'infanzia", **Matteo Orsoni**, *Mariagrazia Benassi, Sara Giovagnoli, Elvis Mazzoni* in Sabrina Panesi & Martina Benvenuti – Promuovere abilità cognitive nella scuola dell'infanzia nell'era digitale: tecnologie sì, tecnologie no?
2021	25th Annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPSY), Milan, Italy, 13-15 September 2021. "PROFFILO: a new digital assessment tool to evaluate learning difficulties in secondary school", **Matteo Orsoni.**, *Martina Benvenuti., Sara Giovagnoli., Elvis Mazzoni., Sara Magri., Lorenzo Bartolini., Samuele Bertani., Mariagrazia Benassi.*
2021	XXVII Congresso Nazionale Associaizone Italiana di Psicologia, Sezione Sperimentale: "La combinazione di modelli di apprendimento non supervisionato e supervisionato per una corretta classificazione dei profili cognitivi di studenti di scuola secondaria", **Matteo Orsoni**, *Martina Benvenuti, Sara Garofalo, Elvis Mazzoni, Mariagrazia Benassi, Sara Giovagnoli* in Sara Garofalo, Livio Finos e Ebisch Sjoerd Johannes Hendrikus - Metodi e tecniche per lo studio delle differenze individuali nelle neuroscienze e nella psicologia cognitiva
2020	XXVI Congresso Nazionale Associazione Italiana di Psicologia, Sezione Sperimentale, Virtual Edition: "Linear and non-linear regression models for antisaccade parameter prediction in healthy and psychiatric subjects: a simulation study", **Matteo Orsoni**, *Roberto Bolzani, Sara Garofalo, Rosa Sant'Angelo, Roberta Raggini, Giovanni Piraccini, Giovanni De Paoli & Mariagrazia Benassi.*
2020	XXVI Congresso Nazionale Associazione Italiana di Psicologia, Sezione Sperimentale, Virtual Edition: "Eye-movements deficits as biomarkers of

schizophrenia: a metanalysis of evidence", *Sara Garofalo*, **Matteo Orsoni**, *Silvia Dal Col, Chiara Ruscelli, Sara Giovagnoli, Mariagrazia Benassi.*

CONFERENCES PRESENTATION - POSTER

2021   European Psychiatric Association (EPA), Virtual conference: "Eye-movements deficits in schizophrenia: A metanalysis of evidence", **Matteo Orsoni**, *Silvia Dal Col, Chiara Ruscelli, Rosa Sant'Angelo & Mariagrazia Benassi.*

2021   European Psychiatric Association (EPA), Virtual conference: "Bayesian models to explain autistic traits in psychiatric population", *Mariagrazia Benassi, Sara Garofalo, Laura Vitali,* **Matteo Orsoni**, *Rosa Sant'Angelo, Roberta Raggini & Giovanni Piraccini.*

2019   50th European Mathematical Psychology Group Meeting (EMPG), University of Heidelberg: "Neuro-Fuzzy Inference System predicts heterogeneity of eye movements in psychiatric populations", **Matteo Orsoni**, *Federica Ambrosini, Sara Garofalo, Giovanni Piraccini, Roberta Raggini, Rosa Sant'Angelo & Mariagrazia Benassi.*

2019   50th European Mathematical Psychology Group Meeting (EMPG), University of Heidelberg: "Fisherian and Bayesian approaches to eye movements analysis in psychotic disorders", **Matteo Orsoni**, *Sara Garofalo, Federica Ambrosini, Giovanni Piraccini, Giovanni De Paoli, Rosa Sant'Angelo, Sara Giovagnoli, Roberto Bolzani & Mariagrazia Benassi.*

PARTICIPATION IN RESEARCH PROJECT

German Federal Ministry of Education and Research (BMBF). "Personalisierte Kompetenzentwicklung und hybrides KI-Mentoring" (tech4compKI). DFKI (Deutsches Forschungszentrum für Künstliche Intelligenz). Project id: 16DHB2208.

From 07/2021 to 07/2023

Progetti di Ricerca di Interesse Nazionale (PRIN). "Computerized Adaptive and Personalized Assessment of Executive Functions and Fluid Intelligence". 2020. Project id: 20209WKCLL_003 [Member of Research Unit]. Principal Investigator: Prof. Luca Stefanutti, University of Padua. University of Padua, University of Bologna, University of Perugia.

From 1/06/2022 to the present

Progetti di Ricerca di Interesse Nazionale (PRIN). "Decision-making through the lens of the motor system: a neurocomputational perspective". PRIN 2022 PNRR [Member of Research Unit]. Principal Investigator: Dott. Sara Garofalo, University of Bologna. University of Bologna, Centro Nazionale delle Ricerche (CNR).

Upcoming to start

ESTABLISHED COLLABORATIONS

Prof. Luca Stefanutti,
FISPPA Department, University of Padova.

Dr.Milos Kravcik.
DFKI (Deutsches Forschungszentrum für Künstliche Intelligenz). The German Research Center for Artificial Intelligence. Educational Tecnology Lab, Berlin, Germany.

Prof. Marco Scutari
IDSIA (Dalle Molle Institute for Artificial Intelligence). Lugano, Switzerland.

Prof.ssa Prandi Catia,
Department of Computer Science and Engineering

Prof. Dubé Adam,
Department of Educational and Counselling Psychology, McGill University, Canada

OUTREACH AND DIVULGATION OF SCIENCE

2018   European Researcher's Night – University of Bologna, Cesena, Italy
2020   European Researcher's Night – University of Bologna, Online Edition, Italy

EDITORIAL BOARDS

2022   Topic Coordinator for Frontiers in Virtual Reality in Medicine with a Research Topic in: "The use of Gamification, Serious Game and Virtual/Augmented Reality for Psychological Interventions and Mental Health". Topic Editors: Dott.Bertini, Flavio., Dott.Lindner Philip., and Dott.Prandi Catia.

SCIENTIFIC PEER-REVIEWER (since)

2021   Current Psychology
2023   Child: Care, Health & Development

MEMBERSHIPS

- Italian Psychological Society (Ordine degli Psicologi dell'Emilia-Romagna) - Member (n.9645)
- Associazione Italiana di Psicologia (AIP). Socio Affiliato (SA) since 2020.

GRANT AND FUNDING

                                                                        AMOUNT

                                                                        4.000 €

2020	Fellowship: "Evaluation methods for DSA". Awarded by Department of Psychology, University of Bologna (IT). Under the supervision of Prof. Mariagrazia Benassi.	
2020 - 2023	Ph.D Fellowship in Psychological Sciences.	45.000 €
2022	**Datathon winner**: "Predict Item difficulty in multiplication games: linear and non-linear models to detect feature effects". International Meeting of Psychometric Society (IMPS), 2022.	1.000 €
2020	PRIN 2020 – Project Title: "Computerized Adaptive and Personalized Assessment of Executive Functions and Fluid Intelligence" [Member of Research Unit]	518.000 €

Awards

Datathon winner: "Predict Item difficulty in multiplication games: linear and non-linear models to detect feature effects". International Meeting of Psychometric Society (IMPS), 2022.

Best full paper award: "Orsoni, M., Pögelt, A., Duong-Trung, N., Benassi, M., Kravcik, M., Grüttmüller, M. (2023). Recommending Mathematical Tasks Based on Reinforcement Learning and Item Response Theory. In: Frasson, C., Mylonas, P., Troussas, C. (eds) Augmented Intelligence and Intelligent Tutoring Systems. ITS 2023. *Lecture Notes in Computer Science*, vol 13891. Springer, Cham. https://doi.org/10.1007/978-3-031-32883-1_2"

OTHER ACTIVITIES

2019-2022	Clinical Activity: "Conducting Neuropsychological Evaluations for DSA" at AUSL della Romagna in collaboration with the Servizio di Potenziamento dell'Età Evolutiva (SPEV), University of Bologna. The service is overseen by Prof. Mariagrazia Benassi and Prof. Sara Giovagnoli from the University of Bologna, Italy.

TECHNICAL SKILLS AND COMPETENCES

- Operative Systems: Linux (Ubuntu), Windows, Mac OS.
- Spreadsheet: Advanced in Excel.
- Statistical Analysis software: SPSS, JASP, R, Python
- Null Hypothesis Significance Testing (NHST).
- Bayesian Data Analysis (Bayesian Generalized Mixed Models); Bayesian Networks (BNs)
- Computational Cognitive Models: Drift Diffusion Models (DDM), Reinforcement Learning (RL)
- Machine Learning models: with MATLAB (ANFIS (Adaptive Neuro-Fuzzy Inference System)), with R (KNN, CART, CIDT, Random Forest, SVM, Neural Networks, Cluster Analysis (K-means, K-medoids), PCA, Text Mining. With Python (an introduction to Deep Learning Models (Forward Neural Networks, Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Adaptive Boosting), Variational Autoencoders (VAE).
- Deep Learning Frameworks: Tensorflow, Pytorch

- Reinforcement Learning Frameworks: Gym, Gymnasium, RLlib, StableBaseline3
- Programming languages: Basic in MATLAB, Advanced in Python, Advanced in R.
- Toolboxes/Software: Neuro-Fuzzy Inference System Toolbox.
- Research techniques: Eye-Tracking.
- Psychological and neuropsychological tests: administration and scoring.