MATTEO BERTUCCO

Department of Neuroscience, Biomedicine and Movement Sciences
University of Verona
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Education

Ph.D. University of Verona, Italy
Physical Exercise and Human Movement Sciences, 2010
Mentor: Prof. Paola Cesari

M.S. University of Verona, Italy
Preventative and Adapted Motor Activity Sciences, 2006

B.S. University of Verona, Italy
Human Movement and Sport Sciences, 2003

Present position

2019-present
Associate Professor
Department of Neuroscience, Biomedicine and Movement Sciences
University of Verona, Italy

Employment history

2017-2019
Senior type B fixed-term Assistant Professor
(Tenure-track Assistant Professor)
Department of Neuroscience, Biomedicine and Movement Sciences
University of Verona, Italy

2016
Tenure-track Assistant Professor
Department of Rehabilitation Sciences
University of Harford, CT, USA

Postdoctoral Training

2010 - 2016
Postdoctoral Research Associate
Department of Biomedical Engineering
University of Southern California, CA, USA
Mentor: Prof. Terence D. Sanger

Visiting Positions

2023 (September - November)

Visiting Professor
Department of Kinesiology
Pennsylvania State University, PA, USA

2018 (February - May)
Visiting Professor
Pediatric Muscle Physiology Lab
Shirley Ryan AbilityLab, IL, USA

2017 (March - May)
Visiting Professor
Department of Rehabilitation Sciences
University of Harford, CT, USA

Current and Past Areas of Research

Motor control, motor learning, biomechanics, muscle fatigue, postural control, decision making, locomotion, neurorehabilitation.

Publications

Peer-Reviewed Journal Articles since Tenure

1. Picelli A, Filippetti M, Pontillo A, Dimitrova E, Valè N, Di Censo R, Smania N, **Bertucco M**. Changes in tibialis anterior muscle activity following tibial nerve block in adults with spastic equinovarus foot: an observational pilot study. Journal of Rehabilitation Medicine. 2025. Dec 1, 57.
2. Nardon M, Piscitelli F, Alessandro C, Tam E, **Bertucco M**. Effects of localized and general fatigue on postural adjustments coupling during predictable external perturbations. Eur J Appl Physiol. 2025; 125(9), 2539–2561.
3. Sinha O, Muttee AP, Wu, JH, **Bertucco M**, Kurtzer I, Singh T. Smooth pursuit eye movements contribute to long-latency reflex modulation in the lower extremity. J Neurophysiol. 2025; 134(3), 998–1006.
4. Tam E, **Bertucco M**, Capelli C. The slow component of oxygen uptake of insulated muscular groups measured with NIRS during intermittent isometric contractions in humans. Physiol Rep. 2025; 13(15), e70491.
5. Nardon M, Sinha O, Kpankpa J, Albenze E, Bonnet C, **Bertucco M***, Singh T*. Prioritized adjustments in posture stabilization and adaptive reaching during neuromuscular fatigue of lower-limb muscles. J Apple Physiol. 2024; 137, 629:645. *Equal contribution.
6. Sinha O, Rosenquist T, Fedorshak A, Kpankpa J, Albenze E, Bonnet C, **Bertucco M**, Kurtzer I, Singh T. Predictive posture stabilization before contact with moving objects: equivalence of smooth pursuit tracking and peripheral vision. J Neurophysiol. 2024; 132, 695:709.
7. Monte A, Benamati A, Pavan A, d'Avella A, **Bertucco M**. Muscle synergies for multidirectional isometric force generation during maintenance of upright standing posture. Exp Brain Res, 2024; 242(8), 1881-1902.
8. Boldo M, Di Marco R, Martini E, Nardon M, **Bertucco M**, Bombieri N. On the reliability of single-camera markerless systems for overground gait monitoring. Comput Biol Med. 2024; 6:171:108101.
9. Piras A, **Bertucco M**, Del Santo F, Meoni A, Raffi M. Postural stability assessment in expert versus amateur basketball players during optic flow stimulation. J Electromyogr Kinesiol. 2024; 74, 102855.

10. Pascucci F, Cesari P, **Bertucco M**, Latash ML. Postural adjustments to self-triggered perturbations under conditions of changes in body orientation. Exp Brain Res. 2023; 241(8), 2163–2177.
11. Tam E, Nardon M, **Bertucco M**, Capelli C. The mechanisms underpinning the slow component of VO2 in humans. Eur J Appl Physiol. 2024; 124(3): 861-872.
12. Martini E, Boldo M, Aldegheri S, De Marchi M, Vale N, Filippetti M, Smania N, **Bertucco M,** Picelli A, Bombieri N. Real-time Human Pose Estimation at the Edge for Gait Analysis at a Distance. In: 2022 18th International Conference on Distributed Computing in Sensor Systems (DCOSS), pp 45–48.
13. Martini E, Boldo M, Aldegheri S, Vale N, Filippetti M, Smania N, **Bertucco M**, Picelli A, Bombieri N. Preserving Data Privacy and Accuracy of Human Pose Estimation Software Based on CNN s for Remote Gait Analysis. In: 2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), pp 3468–3471.
14. Nardon M, Venturelli M, Ruzzante F, Longo V, **Bertucco M**. Response to: Dealing with menstrual cycle in sport: stop finding excuses to exclude women from research. Eur J Appl Physiol. 2022; 122:2491–2492.
15. **Bertucco M**, Nardon M, Mueske N, Sandhu S, Rethlefsen SA, Wren TAL, Sanger TD. The Effects of Prolonged Vibrotactile EMG-Based Biofeedback on Ankle Joint Range of Motion During Gait in Children with Spastic Cerebral Palsy: A Case Series. Phys Occup Ther Pediatr, 2023; 43(3): 351-366.
16. Martini E, Boldo M, Aldegheri S, Valè N, Filippetti M, Smania N, **Bertucco M**, Picelli A, Bombieri N. Enabling Gait Analysis in the Telemedicine Practice through Portable and Accurate 3D Human Pose Estimation. Comput Methods Programs Biomed. 2022; 225:107016.
17. Nardon M, Pascucci F, Cesari P, **Bertucco M**, Latash ML. Synergies Stabilizing Vertical Posture in Spaces of Control Variables. Neuroscience. 2022; 500:79–94.
18. Cesari P, Piscitelli F, Pascucci F, **Bertucco M**. Postural Threat Influences the Coupling Between Anticipatory and Compensatory Postural Adjustments in Response to an External Perturbation. Neuroscience. 2022; 490:25–35.
19. Zandonai T*, **Bertucco M***, Graziani N, Montani V, Cesari P (2022) Transcranial direct current stimulation (tDCS) modulates motor execution in a limb reaching task. Eur J Neurosci. 2022; 56:4445–4454. *Equal contribution.
20. Nardon M, Venturelli M, Ruzzante F, Longo VD, **Bertucco M**. Fasting-Mimicking-Diet does not reduce skeletal muscle function in healthy young adults: a randomized control trial. Eur J Appl Physiol. 2022; 122(3): 651-661.
21. Nardon M, Ruzzante F, O'Donnell L, Adami A, Dayanidhi S, **Bertucco M**. Energetics of walking in individuals with cerebral palsy and typical development, across severity and age: A systematic review and meta-analysis. Gait & Posture. 2021; 90:388–407.
22. Monte A*, **Bertucco M***, Magris R, Zamparo P. Muscle Belly Gearing Positively Affects the Force–Velocity and Power–Velocity Relationships During Explosive Dynamic Contractions. Front Physiol. 2021;12:683931. *Equal contribution
23. Nardello F, **Bertucco M**, Cesari P. Anticipatory and pre-planned actions: A comparison between young soccer players and swimmers. PLoS One. 2021;16(4):e0249635.
24. Borish CN*, **Bertucco M***, Berger DJ, D'Avella A, Sanger TD. Can spatial filtering separate voluntary and involuntary components in children with dyskinetic cerebral palsy? PLoS One. 2021;16(4):e0250001. *Equal contribution
25. **Bertucco M**, Nardello F, Magris R, Cesari P, Latash ML. Postural Adjustments during Interactions with an Active Partner. Neuroscience. 2021;463:14-29.
26. Nardello N, Bertoli E, Bombieri F, **Bertucco M**, Monte A. The Effect of a Secondary Task on Kinematics during Turning in Parkinson's Disease with Mild to Moderate Impairment, Symmetry (Basel). 2020; 12: 1284.

27. **Bertucco M**, Dunning A, Sanger TD. Tuning of Standing Postural Responses to Instability and Cost Function. Neuroscience. 2020; 428; 100–110.
28. Borish CN, **Bertucco M**, Sanger TD. Effect of target distance on controllability for myocontrol. Int. J. Hum. Comput. Stud. 140 (2020) 102432.
29. **Bertucco M**, Lunardini F, Nardon M, Casellato C, Pedrocchi A, Sanger TD. Vibro-tactile EMG-based biofeedback induces changes of muscle activity patterns in childhood dystonia. 9th Int. IEEE/EMBS Conf. Neural Eng., IEEE, 2019: 53–56.
30. **Bertucco M**, Sanger TD. A model to estimate the optimal layout for assistive communication touchscreen devices in children with dyskinetic cerebral palsy. IEEE Trans Neural Syst Rehabil Eng. 2018; 26(7):1371-1380.
31. Borish CN, Feinman A, **Bertucco M**, Ramsy NG, Sanger TD. Comparison of speed-accuracy tradeoff between linear and non-linear filtering algorithms for myocontrol. J Neurophysiol. 2018; 119(6): 2030-2035.
32. Veneri D, Gannotti M, **Bertucco M**, Fournier Hillman SE. Using the ICF model to gain perspective of the benefits of yoga in stroke, MS and children to inform practice for children with CP: A meta-analysis". J Alternat Compl Med. 2018; 24(5): 439:457.
33. Lunardini F, Casellato C, **Bertucco M**, Sanger TD, and Pedrocchi A. Children With and Without Dystonia Share Common Muscle Synergies While Performing Writing Tasks. Ann Biomed Eng. 2017; 45(8):1949-1962.
34. Liyanagamage SA, **Bertucco M**, Bhanpuri NH, Sanger TD. Scaled vibratory feedback can bias muscle use in children with dystonia without changing overall performance in a redundant one-dimensional myocontrol task. J Child Neurol. 2017;32:161-169
35. Lunardini F, Casellato C, **Bertucco M**, Sanger TD, Pedrocchi A. Muscle synergies in children with dystonia capture healthy patterns regardless the altered motor performance. Conf Proc IEEE Eng Med Biol Soc 2015. 2015; 2099-2102.
36. **Bertucco M**, Bhanpuri NH, Sanger TD. Perceived Cost and Intrinsic Motor Variability Modulate the Speed-Accuracy Trade-Off. PLoS One. 2015;10(10): e0139988.
37. Lunardini F, Maggioni S, Casellato C, **Bertucco M**, Pedrocchi A, Sanger TD. Increased task-irrelevant components of muscle activity in childhood dystonia. J Neuroeng Rehabil. 2015; 12: 52.
38. Lunardini F, **Bertucco M**, Casellato C, Bhanpuri NH, Pedrocchi A, Sanger TD. Speed-accuracy trade-off in a trajectory-constrained self-feeding task: a quantitative index of unsuppressed motor noise in children with dystonia. J Child Neurol. 2015;30(12):1676-85.
39. Dunning A, Ghoreyshi A, **Bertucco M**, Sanger TD. The Tuning of Human Motor Response to Risk in a Dynamic Environment Task. PLoS One. 2015;10(4):e0125461.
40. Bhanpuri NH, **Bertucco M**, Young SJ, Lee A, Sanger TD. Multiday transcranial direct current stimulation causes clinically insignificant changes in childhood dystonia: A pilot study. J Child Neurol. 2015; 30(12): 1604-15.
41. **Bertucco M**, Sanger TD. Current and emerging strategies for childhood dystonia. Journal of Hand Therapy. 2015; 28(2):185-93.
42. **Bertucco M**, Dayanidhi S. Can the period of postnatal co-development of the rubrospinal and corticospinal systems provide new insights into refinement of limb movement? J Neurophysiol. 2015; 113: 681–683.
43. Bhanpuri NH*, **Bertucco M***, Ferman D, Young SJ, Liker MA, Krieger MD, Sanger TD. Deep brain stimulation evoked potentials may relate to clinical benefit in childhood dystonia. Brain Stimulation. *Equal contribution. Brain Stimul. 2014; 7(5): 718-726.
44. Milanese C, **Bertucco M**, Zancanaro C. The effects of three different rear knee angles on kinematics and kinetics in sprint start. Biology of Sport. 2014; 31: 209-215.
45. Casellato C, Maggioni S, Lunardini F, **Bertucco M**, Pedrocchi A, Sanger TD. Dystonia: Altered Sensorimotor Control and Vibro-tactile EMG-Based Biofeedback Effects. XIII

Mediterranean Conference on Medical and Biological Engineering and Computing 2013. IFMBE Proceedings. 2014; 41: 1742-1746.
46. Young SJ, **Bertucco M**, Sanger TD. Cathodal transcranial direct current stimulation in children with dystonia: a sham-controlled study. J Child Neurol. 2014; 29(2): 232-239.
47. **Bertucco M**, Sanger TD. Speed-accuracy testing on the Apple iPad® provides a quantitative test of upper extremity motor performance in children with dystonia. J Child Neurol. 2014; 29:1460-1466.
48. **Bertucco M**, Cesari P, Latash ML. Fitts' Law in early postural adjustments. Neuroscience. 2013; 213: 61-69.
49. Young SJ, **Bertucco M**, Sheehan-Stross R, Sanger TD. Cathodal transcranial direct current stimulation in children with dystonia: a pilot open-label trial. J Child Neurol. 2013; 28(10): 1238-1234.
50. **Bertucco M**, Cesari P. Does movement planning follow Fitts' law? Scaling anticipatory postural adjustments with movement speed and accuracy. Neuroscience. 2010; 171(1): 205-213.
51. Milanese C, Bortolami O, **Bertucco M**, Verlato G, Zancanaro C. Anthropometry and motor fitness in children aged 6-12 years. Journal of Human Sport and Exercise. 2010; 5(2) 265-279.
52. **Bertucco M**, Cesari P. Dimensional analysis and ground reaction forces for stair climbing: effects of age and task difficulty. Gait and Posture. 2009; 29(2): 326-331.
53. Cesari P, **Bertucco M**. Coupling between punch efficacy and body stability for elite karate. Journal of Science and Medicine in Sport. 2008; 11(3): 353-356.

PubMed; Google Scholar; ResearchGate

Teaching at the University of Verona

"Biomechanics and motor control"
Master's degree in Preventive and Adapted Exercise Science (Academic Years 2017-2018 to 2024-2025)

"Motor learning and skill acquisition in sport excellence" *(within the course "Exercise and training programs")*
Master's degree in Sport Science and Physical Performance (Academic Years 2016-2017 to 2024-2025)

"Motor development" (*within the course "Physical activity and development"*)
Bachelor's Degree in Sport and Exercise Science (since Academic Year AY 2019-2020)

"Motor control and learning"
Bachelor's Degree in Sport and Exercise Science (since Academic Year 2021-2022)

"Motor control and learning"
Bachelor's Degree in Science in Sports and Well-being (interuniversity / University of Trento) (since Academic Year 2025-2026)

"Human movement and sport practice basics and applications" (*within the course "Fundamentals of physical activity and sport")*
Master's Degree in Sport Management for an innovative and sustainable sport system (Since Academic Year 2023-2024)

"Computational mechanisms underlying sensorimotor learning"

Ph.D. program in Neuroscience, Psychological and Psychiatric Sciences, and Movement Sciences (Academic Years 2022-2023 and 2024-2025)

“Muscle fatigue and intense exercise effects on motor control and learning”
Ph.D. program in Neuroscience, Psychological and Psychiatric Sciences, and Movement Sciences (Academic Year 2023-2024)

“Muscle fatigue and intense exercise effects on motor control and learning”
National PhD program in Kinesiology and Sport Sciences (Academic Year 2023-2024)

“Principles of motor learning and movement analysis” (*within the course “Physiology”)*
Residency Program in Sport and Exercise Medicine (Academic Years 2022-2023 and 2023-2024)

Teaching at the University of Hartford

“Biomechanics”
Doctor of Physical Therapy (DPT) program (Fall 2016)

Teaching at the University of Southern California

Invited lectures for the course 'Introduction to Biomimetic Neural Engineering' (BME452), Bachelor of Science in Biomedical Engineering:

- October 19, 2011: The electrophysiology and information theory in clinical childhood movement disorders.
- September 12, 2012: What does engineering have to do with childhood movement disorders?
- October 30, 2013: What does biomedical engineering have to do with childhood movement disorders?

Service

2025-present
Coordinator of the Study Group on "Biomechanics, Motor Control and Learning”, Italian Society of Human Movement and Sport Sciences.

2022-present
Coordinator of the master’s degree in Preventive and Adapted Exercise Science, University of Verona.

2022-present
Member of the Teaching Committee for the bachelor’s Degree in Sport and Exercise Science and master's degree in Preventive and Adapted Exercise Science, University of Verona.

2022-present
Member of the Quality Assurance Board for the bachelor’s Degree in Sport and Exercise Science and master's degree in Preventive and Adapted Exercise Science, University of Verona.

2017-2020
Member of the Committee for the internship’s programs for the bachelor’s Degree in Sport and Exercise Science and master's degree in Preventive and Adapted Exercise Science, University of Verona.

2017-2021
Coordinator for mathematics and physic minimal requirement programs for the bachelor's Degree In Sport and Exercise Science, University of Verona.

Research Support

2023-2025
Co-Principal Investigator, "Multiscale Analysis of Human and Artificial Trajectories: Models and Applications".
PRIN 2022 (Research Projects of National Interest, Italy).
€ 280,798 total cost. (€ 68,010.00 University of Verona, Bertucco)

2020-2021
Principal Investigator, "Neural and metabolic mechanisms of muscle fatigue in subjects with cerebral palsy".
Glia Neuroscience Onlus.
€ 4,000 total cost.

2018-2019
Principal Investigator, "A top-down approach to study the supraspinal and metabolic factors of muscle fatigue in children and adolescents with cerebral palsy".
Brain Research Foundation Verona and Intesa Sanpaolo Banks.
€ 12,000 total cost.

2017-2018
Principal Investigator, "Effects of the fasting mimicking diet on the central and peripheral components of muscle fatigue".
Create Cures Foundation.
€ 12,000 total cost.

2016
Principal Investigator, "Anticipatory postural adjustments during motor development in children with cerebral palsy".
Vincent Coffin Grant, University of Hartford, CT, USA.
$ 3,000 total cost.

2014-2015
Co-Principal Investigator, "Augmented sensory feedback to improve selective motor control during gait in children with cerebral palsy".
California Community Foundation.
$ 50,000 total cost

2014-2015
Co-Principal Investigator, "Augmented sensory feedback to improve selective motor control during gait in children with cerebral palsy".
Southern California Clinical and Translational Science Institute. Research Pilot Funding Award.
$ 27,000 total cost

Honors/Awards

2016 Emerging Researcher Travel Award.

ISAAC (The International Society for Augmentative and Alternative Communication) Conference 2016, Toronto, Canada.
Award CAD $ 1,000

2015 USC Postdoc Association travel award.
Participation in the 2015 Annual Meeting of the Society for the Neural Control of Movement, Charleston, SC, USA.
Award $ 3,000

2014 ISSNAF (Italian Scientists and Scholars in North America) Awards 2014. Finalist selected.
Project presented: “The Tuning of Human Motor Behavior to Uncertainty and Cost”.

2013 USC Postdoc Association travel award.
Participation in the 2013 Annual Meeting of the Society for the Neural Control of Movement, San Juan, Puerto Rico, USA.
Award $ 3,000

2008 Young Researchers Award for Poster Presentation, “The Fitts’ law and the anticipatory of postural adjustment”.
5th Scientific Conference on Kinesiology in Zagreb, Croatia, September 10th- 14th, 2008.
Award € 500

Invited Research Presentations

1. Department of Neurosciences, Ophthalmology and Genetics, University of Genoa, Italy, September 23, 2025.
2. Department of Biomedical Sciences, University of Padua, Italy, February 19, 2024.
3. “The Action Club” Department of Kinesiology, The Pennsylvania State University, PA, USA, February 16, 2024.
4. Department of Kinesiology, University of Rhode Island, RI, USA. October 26, 2023.
5. Centro Neurolesi Bonino Pulejo Messina, IRCCS, Italy, June 26, 2023.
6. Department of Kinesiology, University of Rhode Island, RI, USA, March 5, 2018.
7. Rehabilitation Institute of Chicago (RIC), Chicago, USA, May 16, 2016.
8. Center for Mind/Brain Sciences (CIMeC), University of Trento, Trento, Italy. July 29, 2015.
9. Department of Exercise Science, University of South Carolina, Columbia, SC, USA, April 17, 2015.
10. Physical Therapy Program, School of Medicine, Washington University in St. Louis, St. Louis, MO, USA, February 24, 2015.
11. School of Biological and Health Systems Engineering, Arizona State University, Tempe, AZ, USA, February 16, 2015.
12. Department of Kinesiology and Community Health, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, USA, January 22, 2015.
13. Children’s Hospital of Los Angeles, Los Angeles, CA, USA, August 26, 2014.
14. Department of Kinesiology, Michigan State University, East Lansing, USA, January 15, 2014.
15. Department of Neurosciences, Biomedicine and Movement Sciences, University of Verona, Italy, June 5, 2013.
16. Department of Neurosciences, Biomedicine and Movement Sciences, Italy, May 15, 2012.
17. Division of Biokinesiology and Physical Therapy, University of Southern California, Los Angeles, USA, February 18, 2011.
18. Faculties of Human Movement and Sport Sciences & Medicine and Surgery, University of Verona, Italy, March 6, 2010.

19. Rehabilitation Institute of Chicago (RIC), Chicago, USA, February 13, 2010.

Editorial Boards

Exercise, Sport, and Movement, American College of Sports Medicine
Serving as an Editorial Board member since June 2024

Ad hoc Journal Reviewer

American Journal of Physiology-Regulatory, Integrative and Comparative Physiology, since 2024
Experimental Brain Research, since 2022
Gait and Posture, since 2020
Human Movement Science, since 2020
IEEE Transactions on Neural Systems and Rehabilitation Engineering, since 2022
Journal of Child Neurology, since 2020
Journal of Motor Behavior, since 2018
Journal of NeuroEngineering and Rehabilitation, since 2024
Journal of Neurophysiology, since 2024
Journal of Sports Sciences, since 2014
Neuroscience, since 2024
Scientific Reports, since 2021

Professional Affiliations

Society for the Neural Control of Movement
Society for Neuroscience
International Society of Motor Control
Società Italiana delle Scienze Motorie e Sportive (Italian Society of Movement and Sport Sciences)

Prior Competitive Athletic Career

Karate competitive career – Kumite discipline (fighting)
Main results:
2009
1st place, World Championships WUKO, Guadalajara, Mexico Individual competition.
1st place, World Championships WUKO, Guadalajara, Mexico Team competition.

2007
1st place, World Championships WUKO, Valencia, Spain Team competition.

2006
1st place, European Championships WUKO, St. Polten, Austria Team competition.
3rd place, European Championships WUKO, St. Polten, Austria Individual competition.
1st place, Italian Championships, Bari, Italy

2005
2nd place, World Championships 2005 WKC, Fortaleza, Brazil Individual competition.

2004
1st place, Italian Championships, Ariccia, Rome, Italy

1998
1st place, Italian Championships Junior, Lucca, Italy

Won more than 100 competitions at the international and national level.

Athletic Credentials

Licenses

- Karate instructor, black belt 5th Dan, FESIK (Italian Federation of Sportive Karate)
- Parachuting license (ENAC)
- Swimming coach 2nd level, FIN (Italian Federation of Swimming)
- Certificate of Military Parachutist, Italian Army

Personal Interests

- Sports: karate, skydiving, cycling, running, tennis
- Wilderness: Hiking, Climbing
- Culture: Concerts, Museums, Movies, Reading, Food, Wine and Beer Tasting