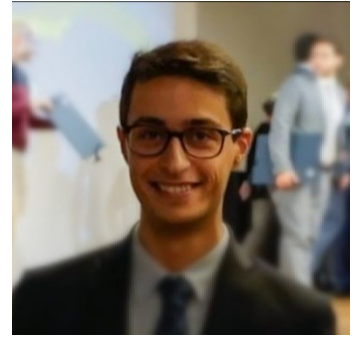


Marco Ghislieri

*Post-Doc Research Assistant at Department
of Electronics and Telecommunications of
Politecnico di Torino*



Personal Details

- **Place and Date of Birth:** Alessandria (AL), Italy - 12/11/1991
- **Address:** Via Prov. Alessandria – Sale, 5 (Castelceriolo), Alessandria – 15122
- **Phone Number:** (+39) 334 376 3047
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Education and Academic Career

**RESEARCH ASSISTANT / Post-Doc Research Assistant at Politecnico di Torino - Turin
12/01/2020 – 11/30/2021**

- University: Politecnico di Torino
- Research: *“Assessment of motor control strategies in patients affected by Parkinson’s Disease before and after sub-thalamic nucleus deep brain stimulation”*

**DEGREE / Doctor of Philosophy in Bioengineering and Medical and Surgical Sciences
Turin – 10/01/2017 – 07/26/2021**

- University: Politecnico di Torino
- Thesis: *“Muscle Synergy Assessment during Cyclic and Non-Cyclic Movements: Methodological Issues and Application-oriented Studies”*
- Supervisors: prof. Marco Knaflitz and prof. Valentina Agostini

**SCHOLARSHIP / Scholarship Holder at Politecnico di Torino - Turin
01/18/17 – 09/31/17**

- University: Politecnico di Torino and University of Turin – Division of Hematology of Città della Scienza e della Salute of Turin
- Project’s title: *“Design and Validation of a New Biobank System for Hematologic Neoplasms”*

**DEGREE / Master of Science in Biomedical Engineering - Turin
2014 - 2016**

- University: Politecnico di Torino
- Thesis: *“Effect of Yoga meditation on the central nervous system: a pilot study”*
- Supervisors: prof. Marco Knaflitz and prof. Valentina Agostini
- Grade: **110/110**

**DEGREE / Bachelor of Science in Biomedical Engineering - Turin
2010 - 2014**

- University: Politecnico di Torino
- Thesis: *"Ingegneria Clinica: Servizio di ingegneria clinica presso il centro emergenze San G. Bosco di Torino"*
- Supervisor: prof. Filippo Molinari
- Grade: **94/110**

Teaching Activity**LAB TEACHING ASSISTANT / Politecnico di Torino – Turin
2017 – present**

- **First Level Degree in Biomedical Engineering:** *Bio-images* (prof. Valentina Agostini)
- **Second Level Degree in Biomedical Engineering:** *NeuroEngineering* (prof. Valentina Agostini), and *Design of Implantable Medical Devices* (prof. Marco Knafnitz)

**TEACHING ASSISTANT / Politecnico di Torino – Ivrea
2018 – present**

- **Specializing Master' Program in Telemedicine:** *Technologies supporting telemedicine* (prof. Alberto Vallan)

**TEACHING ASSISTANT / Università di Torino – Ivrea
2018 – present**

- **First Level Nursing Degree:** *Telemedicine in Geriatrics* (prof. Paola Maina)

Other Experience**PEER-REVIEW / Peer-Reviewer for International Journals
2018 – present**

- **Scientific Peer-Reviewed Journals:** *Frontiers in Sports Science, Technology and Engineering* (2 reviews); *Frontiers in Human Neuroscience* (2 review), *IEEE Transactions on Neural Systems and Rehabilitation Engineering* (1 article), *Journal of NeuroEngineering and Rehabilitation* (8 reviews), *Gait and Posture* (1 review), *Computer Methods and Programs in Biomedicine* (1 review), and *Journal of Gerontology and Geriatrics* (2 reviews).

Memberships, Honors, and Awards

AWARDS / My Research in 3 minutes – Politecnico di Torino – November 2019

MEMBERSHIPS / Member of the IEEE – Advancing Technology for Humanity since 2019

Research Interest

Dr. Marco Ghislieri is mainly active in the field of **biomedical signal processing and interpretation**, specifically in the analysis of **surface electromyographic (sEMG)** and **kinematic signals** during walking tasks. His main applications in this field are:

- Analysis of **muscle activation patterns** both in physiological and pathological conditions during cyclical movements through innovative deep learning-based approaches. More specifically, Dr. Ghislieri recently proposed and validated on both synthetic and experimental sEMG signals an innovative deep learning-based **muscle activity detector** to precisely identify the start and end time-instants of muscle activations during human movements.
- Evaluation of the **modular organization of the central nervous system** during cyclic (i.e., walking) and non-cyclic (i.e., upright stance) movements based on the extraction of the **muscle synergies** from sEMG signals. Dr. Ghislieri's studies are mainly focused on the definition and validation of **novel sEMG signal processing methods** to be used as pre-processing steps before muscle synergy extraction. Moreover, these methods are currently used in clinics to assess differences in motor control strategies between healthy subjects and patients affected by neurodegenerative diseases (i.e., Parkinson's disease).

Further details about Dr. Ghislieri's research can be found at the following link: <https://biolab.polito.it>

Research Output

PEER-REVIEWED CONFERENCE PROCEEDINGS

- Dotti, G., **Ghislieri, M.**, Rosati, S., Agostini, V., Knaflitz, M. & Balestra, G. (2021) The Effect of Number of Gait Cycles on Principal Activation Extraction. *2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2021. Doi: 10.1109/EMBC46164.2021.9629818.
- Dotti, G., **Ghislieri, M.**, Rosati, S., Agostini, A., Knaflitz, M., & Balestra, G. Influence of Gait Cycle Normalization on Principal Activations. (2021) *IEEE International Symposium on Medical Measurements and Applications (MeMeA)*, Lausanne, Switzerland, 2021, doi: 10.1109/MeMeA52024.2021.9478738.
- **Ghislieri, M.**, Knaflitz, M., Labanca, L., Barone, G., Bragonzoni, L., Benedetti, M.G., & Agostini, V. Methodological issues in the assessment of motor control during single-leg stance. (2020) *IEEE International Symposium on Medical Measurements and Applications (MeMeA)*, Bari, Italy, 2020, pp. 1-6, doi: 10.1109/MeMeA49120.2020.9137180.
- **Ghislieri, M.**, Pavanelli, E., Rosati, S., Balestra, G., Knaflitz, M., & Agostini, V. (2020). A Machine Learning Approach for Muscle Activity Detection. *VII Congress of the National Group of Bioengineering, 2020 (GNB)*. (In press)
- Fortunato, D., **Ghislieri, M.**, Rosati, S., Balestra, G., Knaflitz, M., & Agostini, V. (2020). Human Activity Recognition through Wearable Sensors: A Deep Learning Approach. *VII Congress of the National Group of Bioengineering, 2020 (GNB)*. (In press)
- **Ghislieri, M.**, Agostini, V., & Knaflitz, M. (2019). How to Improve Robustness in Muscle Synergy Extraction. *41st International Engineering in Medicine and Biology Conference (EMBC)*, Berlin, Germany, 2019, pp. 1525-1528, doi: 10.1109/EMBC.2019.8856438.
- Ferrero, S., Zaccaria, G. M., Barbero, D., Evangelista, A., Di Rocco, A., Re, A., Stefoni, V., Cavallo, F., Vitolo, U., Balzarotti, M., Rusconi, C., de Silva, G., **Ghislieri, M.**, Omedè, P., Zamò, A., Ciccone, G., Gattei, V., Gaidano, G., Cortellazzo, S., & Ladetto, M. (2019).

- Comprehensive Analysis of Baseline Outcome Biopredictors in Younger Patients with Mantle Cell Lymphoma: The Ancillary Biological Studies of Fondazione Italiana Linfomi (FIL). *Hemasphere* 3, 569-570. 2019. doi: 10.1097/01.HS9.0000563272.02759.6b.
- Zaccaria, G. M., Ferrero, S., Passera, R., Evangelista, A., Lo Schirico, M., Dogliotti, I., **Ghislieri, M.**, Genuardi, E., Bomben, R., Gattei, V., Ciccone, G., Tani, M., Gaidano, G., Volpetti, S., Cabras, M. G., Di Renzo, N., Merli, F., Vallisa, D., Spina, M., Pascarella, A., Latte, G., Patti, C., Pozzato, G., Fabbri, A., Cortellazzo, S., & Ladetto, M. (2018). The Engineered MIPI (e-MIPI), a Candidate Data-Mining Based Mantle Cell Lymphoma Prognostic Index Developed from Dataset of Fondazione Italiana Linfomi (FIL) MCL0208 Phase III Trial. *Blood*, 132 (Suppl 1), 2890-2890. 2018. doi: 10.1182/blood-2018-99-114168.
 - **Ghislieri, M.**, Agostini, V., & Knaflitz, M. (2018). The Effect of Signal-to-Noise Ratio on Muscle Synergy Extraction. *IEEE Life Sciences Conference (LSC)*, Montreal, QC, 2018, pp. 227-230. doi: 10.1109/LSC.2018.8572075.
 - Agostini, V., Rimini, D., **Ghislieri, M.**, Knaflitz, M., Frola, U., & Trucco, M. (2018). Muscle synergies in patients with low back pain: A statistical gait analysis study pre- and post-rehabilitation. *IEEE International Symposium on Medical Measurements and Applications (MeMeA)*, 2018 (pp. 1-6). IEEE. doi: 10.1109/MeMeA.2018.8438803.
 - Zaccaria, G. M., Ferrero, S., Evangelista, A., Rosati, S., Castagneri, C., **Ghislieri, M.**, Barbero, D., Genuardi, E., Lo Schirico, M., Zamò, A., Vitolo, U., Bomben, R., Gattei, V., Galimberti, S., Di Paolo, A., Rossi, D., Gaidano, G., Di Rocco, A., Cortelazzo, S., Boccadoro, M., Balestra, G., & Ladetto, M. (2017). Delphi, a Data Warehouse to Discover Associations between Variables in Clinical Trials: Application to the Fondazione Italiana Linfomi (FIL) MCL0208 Phase III Trial. *Blood*, 130 (Suppl 1), 3451. doi: 10.1182/blood.V130.Suppl_1.3451.3451.

PEER-REVIEWED PAPERS

- Cerone, G.L., Giangrande, A., **Ghislieri, M.**, Gazzoni, M., Piitulainen, H. & Botter, A. (2022) Design and validation of a wireless Body Sensor Network for integrated EEG and HD-sEMG acquisitions. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 2022. Doi: 10.1109/TNSRE.2022.3140220.
- Zaccaria, G.M., Ferrero, S., Hoster, E., Passera, R., Evangelista, A., Genuardi, E., Drandi, D., **Ghislieri, M.**, Barbero, D., Del Giudice, I., Tani, M., Moia, R., Volpetti, S., Cabras, M.G., Di Renzo, N., Merli, F., Vallisa, D., Spina, M., Pascarella, A., Latte, G., Patti, C., Fabbri, A., Guarini, A., Vitolo, U., Hermine, O., Kluin-Nelemans, H., Cortelazzo, S., Dreyling, M. & Ladetto, M. (2022) A Clinical Prognostic Model Based on Machine Learning from the Fondazione Italiana Linfomi (FIL) MCL0208 Phase III Trial. *Cancers*, 2022. Doi: 10.3390/cancers14010188.
- Dos Anjos, F.V., **Ghislieri, M.**, Cerone, G.L., Pinto, T.P & Gazzoni, M. (2022) Changes in the distribution of muscle activity when using a passive trunk exoskeleton depend on the type of working task: A high-density surface EMG study. *Journal of Biomechanics*, 2022. Doi: 10.1016/j.jbiomech.2021.110846.
- Labanca, L., **Ghislieri, M.**, Knaflitz, M., Barone, G., Bragonzoni, L., Agostini, V. & Benedetti, M.G. (2021) Muscle synergies for the control of single-limb stance with and without visual information in young individuals. *BMC Sports Science, Medicine and Rehabilitation*, 2021. Doi: 10.1186/s13102-021-00392-z.

- **Ghislieri, M.**, Cerone, G. L., Knaflitz, M. & Agostini, V. (2021) Long short-term memory (LSTM) recurrent neural network for muscle activity detection. *Journal of neuroengineering and rehabilitation*, 2021. Doi: 10.1186/s12984-021-00945-w.
- Labanca, L., Mosca, M., **Ghislieri, M.**, Agostini, V., Knaflitz, M., & Benedetti, M.G. (2021). Muscle activations during functional tasks in individuals with chronic ankle instability: a systematic review of electromyographical studies. *Gait & Posture*, 2021. Doi: 10.1016/j.gaitpost.2021.09.182.
- Rosati, S., **Ghislieri, M.**, Dotti, G., Fortunato, D., Agostini, V., Knaflitz, M., & Balestra, G. (2021) Evaluation of Muscle Function by Means of a Muscle-Specific and a Global Index. *Sensors*, 2021. Doi: 10.3390/s21217186.
- **Ghislieri, M.**, Cerone, G. L., Knaflitz, M., & Agostini, V. (2021) Long short-term memory (LSTM) recurrent neural network for muscle activity detection. *Journal of NeuroEngineering and Rehabilitation*, 2021. Doi: 10.1186/s12984-021-00945-w.
- **Ghislieri, M.**, Agostini, V., Rizzi, L., Knaflitz, M., & Lanotte M. (2021) Atypical Gait Cycles in Parkinson's Disease. *Sensors*, 2021. Doi: 10.3390/s21155079.
- Ballarini, R., **Ghislieri, M.**, Knaflitz, M., & Agostini, V. (2021) An Algorithm for Choosing the Optimal Number of Muscle Synergies during Walking. *Sensors*, 2021. Doi: 10.3390/s21103311.
- **Ghislieri, M.**, Knaflitz, M., Labanca, L., Barone, G., Bragonzoni, L., Benedetti, M.G., & Agostini, V. (2020). Muscle Synergy Assessment during Single-Leg Stance. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 2020. doi: 10.1109/TNSRE.2020.3030847.
- Agostini, V., **Ghislieri, M.**, Rosati, S., Balestra, G., & Knaflitz, M. (2020). Surface electromyography applied to gait analysis: how to improve its impact in clinics? *Frontiers in Neurology*, 11, p.994. doi: 10.3389/fneur.2020.00994.
- **Ghislieri, M.**, Agostini, V., & Knaflitz, M. (2020). Muscle Synergies Extracted Using Principal Activations: Improvement of Robustness and Interpretability. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, vol. 28, no. 2, pp. 453-460, Feb. 2020, doi: 10.1109/TNSRE.2020.2965179.
- **Ghislieri, M.**, Gastaldi, L., Pastorelli, S., Tadano, S., & Agostini, V. (2019). Wearable Sensors to Assess Standing Balance: A systematic review. *Sensors*, 2019, 19(19), 4075. doi: 10.3390/s19194075.
- Zaccaria, G. M., Ferrero, S., Rosati, S., **Ghislieri, M.**, Genuardi, E., Evangelista, A., Sandrone, R., Castagneri, C., Barbero, D., Lo Schirico, M., Arcaini, L., Molinari, A. M., Ballerini, F., Ferreri, A., Omedè, P., Zamò, A., Balestra, G., Boccadoro, M., Cortellazzo, S., & Ladetto, M. (2019). Applying data warehousing to a phase III clinical trial from the Fondazione Italiana Linfomi (FIL) ensures superior data quality and improved assessment of clinical outcomes. *JCO Clinical Cancer Informatics*, 2019. doi: 10.1200/CCI.19.00049.
- Taborri, J., Agostini, V., Artemiadis, P. K., **Ghislieri, M.**, Jacobs, D. A., Roh, J., & Rossi, S. (2018). Feasibility of muscle synergy outcomes in clinics, robotics, and sports: A systematic review. *Applied Bionics and Biomechanics*, 2018, vol. 2018. doi: 10.1155/2018/3934698.

PEER-REVIEWED BOOK CHAPTERS

- Agostini, V., **Ghislieri, M.**, Rosati, S., Balestra, G., Dotti, G., & Knaflitz, M. Statistical Gait Analysis based on surface electromyography. *Chapter of Medicine-Based Informatics and Engineering*. Chapter 3. Doi: 10.1007/978-3-030-87845-0.

A complete list of Dr. Ghislieri's publications can be found at the following links:

<https://www.scopus.com/authid/detail.uri?authorId=57202379042> (Scopus)

<https://scholar.google.com.tw/citations?user=cQdvUtEAAAAJ&hl=it&oi=ao> (Google Scholar)

Turin, 1/24/2022

Marco Ghislieri
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