Alice Mantoan

Curriculum Vitae

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Address: via Vittoria Nenni 20/6, 42020 Albinea (RE), Italy.
Phone: +39 380 2996274
Email: ali.mantoan@gmail.com
PEC: alice.mantoan@ingpec.it
LinkedIn: it.linkedin.com/pub/alice-mantoan/51/412/b79/

Education

2015 **PhD in Information Engineering**, University of Padova
Area: Bioengineering
PhD Thesis title: *Towards the application of multi-DOF EMG-driven neuromusculoskeletal modeling in clinical practice: methodological aspects*
PhD Thesis field: Neuromusculoskeletal modeling

2011 **State Exam** - Information Engineering

2011 **Master Degree in Bioengineering**, University of Padova
Final Grade: **110/110**
Thesis title: *Underwater Gait Analysis: A Markerless Approach*
Internship at the Bioengineering of Human Movement Laboratory, University of Padova
Thesis field: Human Movement Analysis

2008 **Bachelor Degree in Biomedical Engineering**, University of Padova
Final Grade: **108/110**
Thesis title: *Analysis of skeletal and muscular structures in hip stability*
Interniship at the Biomechanics Laboratory, Istituto Ortopedico Rizzoli, Bologna
Thesis field: Biomechanics

2005 Scientific High School Diploma, Final grade: 100/100

Current Position

Jul 2024 - **Product Manager** at **Henesis Srl**, Parma, Italy (https://henesis.eu/)

I'm responsible for the medical device ARC intellicare (https://www.arc-intellicare.com/).

Main Professional Expertise

- Software solutions and medical devices for tele-rehabilitation applications according to current Regulations and Standards (e.g., MDR 2017/745, IEC62304, ISO13485, GDPR)
- Agile Software Development (Scrum)
- Product Design and Development
- Product Training, Technical Support and Customer Care
- Health Technology Assessment
- Clinical Research
- Project & Scientific Writing
- Project Management
- Biosignals (EMG, ECG) and inertial data acquisition and analysis
- Neuromusculoskeletal Modeling and Simulation
- Biomechanics and Human Motion Analysis

Professional Experiences

2021 - 2024 **Product Owner** at Henesis Srl
I led product development activities, especially for what concerned SW components of ARC intellicare, a medical device for tele-rehabilitation (https://www.arc-intellicare.com/)

2017 - 2021 **Senior Research & Development Engineer** at Camlin Ldt
Health R&D Division, Parma, Italy

2015 - 2016 **Customer Care Specialist** at Sigma Informatica Spa, Health Division
Software technologies and solutions for the Healthcare systems (http://www.sigmainformatica.com/)
Responsible for Customer Care at San Bortolo Hospital in Vicenza
Service for the General Informatics and Clinical Engineering, ASL 6

2016 **Gait and Motion Analysis Lab Engineer**, Technical Responsible for the Bioengineering and Clinical Movement Analysis Laboratory, Dept. of Physical Medicine and Rehabilitation, Padova Hospital

2015 **Research Fellow** at the Dept. of Management and Engineering, University of Padova
within the EU project BioMot (*Smart Wearable Robots with Bioinspired Sensory-Motor Skills)*
Topic: Analysis of the sensitivity of neuromusculoskeletal models and simulations with the CEINMS software (https://simtk.org/home/ceinms)
Development of software tools to simplify and fasten the workflow for the data processing and analysis (https://simtk.org/projects/motonms, https://simtk.org/projects/bops)

2010 - 2011 **Research Engineer** at the Bioengineering of Human Movement Laboratory, Dept. of Information Engineering, University of Padova
Topic: Markerless Gait Analysis of ACL-injured subjects in and out of water

2008 **Stage** at the Biomechanics Laboratory, Istituto Ortopedico Rizzoli, Bologna

International Experiences

2012 - 2013 **Visiting PhD Student** at the Department of Neurorehabilitation Engineering, University Medical Center, Göttingen, Germany, under the supervision of Prof. Dario Farina
Period: June - September 2012, and July 2013.

2010 **Erasmus Exchange Student** at KTH Royal Institute of Technology of **Stockholm**, Sweden
School of Technology and Health (STH)
Period: January - June 2010.
Attended courses:
Intermediate Technical English course (grade 28/30)
Simulation Methods in Medical Engineering (grade 29/30)
Biomechanics and Neuronics, with a project on: Brain Injuries in Ice Hockey including FEM dynamic simulations with LS-DYNA software (grade 30/30)
3D Image Reconstruction in Medicine, based on a Matlab project:
Restoration of Simulated SPECT images in Matlab. (grade 30/30)

Specialization Courses and Workshops

- **Digital innovation and information systems for the governance of healthcare organizations**, ALTEMS (Alta Scuola di Economia e Management dei Sistemi Sanitari, High School of Economics and Management of Health Systems), Rome, March-November 2021(80h)
- **Fondamenti di Operations Management in Sanitá**, Convegno Nazionale Associazione Italiana Ingegneri Clinici (AIIC) 2020, November 14th 2020 (5h)
- **Project Management**, Bologna Business School (https://www.bbs.unibo.it/open-program/project-management/), May-June, 2020 (32h)

- Workshop **Lean Six Sigma**, Areténa, Padova, January 25th 2020
- **Health Technology Assessment (HTA)**. Economic Evaluation Tools for Decision-Making in the Healthcare Sector, Ca' Foscari Challenge School, Laboratory part of the 2nd Level Master course in Health Economics and Management, Venice, July 8th-12th, 2019
- **International Standard ISO 14155:2011**, Clinical Investigation of medical devices for human subjects - Good Clinical Practice (GCP), Pinerolo (Turin), November 6th, 2018
- Analisi Strumentale del movimento dell'arto superiore nel paziente con esiti di lesione del sistema nervoso centrale: interpretazione dei dati, SIAMOC (Italian Society of Movement Analysis in Clinics) course, Correggio Hospital, February 23rd, 2018
- Nuove evidenze per l'acquisizione ed interpretazione del segnale EMG: dal bipolare al multicanale e ritorno, SIAMOC (Italian Society of Movement Analysis in Clinics) Pre-conference course, Turin, October 4th, 2017
- Introduction to object-oriented programming in C++, Department of Management and Engineering, University of Padova, 2012 (40h)
- Basic Gait Course, Clinical Gait Analysis: A focus on interpretation, Leuven, Belgium, June 27th - 29th, 2013
- Academic English Course, Speaking, Univ. Language Center, Univ. of Padova, 2012 (32h)

Technical skills

Healthcare informatics	E-health and Clinical web applications (e.g., electronic prescription)
Biomechanical tools	OpenSim (http://opensi.stanford.edu/) NMSBuilder (http://www.nmsbuilder.org/index.html)
Motion analysis instruments	Motion Capture Systems (BTS Smart, Qualisys, Vicon) Force Platforms (Bertec, AMTI, Kistler) EMG systems (Cometa Wave Wireless EMG, BTS FREEEMG) Inertial Measurement Units

Information technology skills

Operating Systems	Windows (very good), GNU/Linux (very good), Mac OS X (very good)
Software	Microsoft Office (very good) Latex (very good), Sphinx (good)
Programming languages	Matlab (good), Python (good), C++ (basic)
Versioning Systems	Git (good)
GitHub account *Open Source projects*	https://github.com/alicemantoan https://github.com/RehabEngGroup/MOtoNMS https://github.com/RehabEngGroup/BOPS

Professional Affiliations

- 2021-2024, Member of Italian Association of Clinical Engineers (AIIC)
- 2016-2017, Member of "Ordine degli Ingegneri" (National Engineer's Register), Information Engineering Area, Venice
- 2013, Member of Gait & Clinical Movement Analysis Society (GCMAS)
- 2011, Member of Italian Society of Movement Analysis in Clinics (SIAMOC)

Publications

1. M. Capecci, R. Cima, F. A. Barbini, **A. Mantoan**, F. Sernissi, S. Lai, R. Fava, L. Tagliapietra, L. Ascari, R. N. Izzo, M. G. Ceravolo, Telerehabilitation with ARC Intellicare to Cope with Motor and Respiratory Disabilities: Results about the Process, Usability, and Clinical Effect of the "Ricominciare" Pilot Study. Sensors 2023, 23, 7238. https://doi.org/10.3390/s23167238, pp. 1-22
2. R. Cima, **A. Mantoan**, S. Lai, L. Moro, R. Brondi, F. Sernissi, L. Ascari, M. Hibel, R. Izzo, P. Casoli, M.G. Ceravolo, M. Capecci, Tele-riabilitazione motoria e respiratoria post-COVID-19 con ARC-Intellicare: usabilità, gradimento e risultati clinici preliminari, *Italian Society of Physical and Rehabilitation Medicine (SIMFER) Conference*, October 28th-31st 2021
3. R. Cima, F. Sernissi, **A. Mantoan**, S. Lai, L. Ascari, M.G. Ceravolo, M. Capecci, Post-COVID19 telerehabilitation with AI-based platform enabling motor and respiratory personalized home rehabilitation (ARC-Intellicare): preliminary results, *Italian Society of Clinical Movement Analysis (SIAMOC) conference*, September 30th - October 1st 2021
4. B. L. S. Bedo, **A. Mantoan**, D. S. Catelli, W. Cruaud, M. Reggiani, M. Lamontagne, BOPS: a Matlab toolbox to batch musculoskeletal data processing for OpenSim, *Comput Methods Biomech Biomed Engin* (2021) 1-11
5. S. Lai, **A. Mantoan**, F. Sernissi, L. Moro, R. Brondi, G. Avveduto, R. Panero, E. Ponzo, I. Abbiate, A. Revel, R. Odoni, L. Ascari, ARC-Intellicare, A home-based platform for an integrated rehabilitation care: the Italian case study, In: *Global Clinical Engineering Journal, Special Issue 2: 3rd ICEHTMC Proceedings*, 2019
6. **A. Mantoan**, S. Lai, L. Moro, A. P. Bardelli, M. Ugazzi, A. Turolla, L. Ascari, A Preliminary Study on Quantitative Assessment of Functional Tasks on Stroke Patients Using A Novel Wearable Platform, In: Masia L., Micera S., Akay M., Pons J. (eds) *Converging Clinical and Engineering Research on Neurorehabilitation III*. ICNR 2018. Biosystems & Biorobotics, vol 21. Springer, Cham
7. L. Moro, **A. Mantoan**, S. Lai, A.P. Bardelli, P. Cottone, L. Kubin, M. Mastroleo, L. Mussi, E. Vicari, R. Brondi, L. Ascari, A novel Artificial Intelligence – powered mobile platform for home-based rehabilitation, *World Congress of Biomechanics* (WCB), July 8th-12th 2018, Dublin, Ireland
8. **A. Mantoan**, C. Pizzolato, M. Sartori, Z. Sawacha, C. Cobelli, M. Reggiani, MOtoNMS: A Matlab Toolbox to Process Motion Data for Neuromusculoskeletal Modeling and Simulation, *Source Code for Biology and Medicine* (2015) 10:12
9. E. Ceseracciu, **A. Mantoan**, M. Bassa, J. C. Moreno, J. L. Pons, G. Asin Prieto, A. J. del Ama, E. Marquez-Sanchez, A. Gil-Agudo and M. Reggiani, A Flexible Architecture to Enhance Wearable Robots: Integration of EMG-informed Models, *International Conference on Intelligent Robots and Systems* (IROS), September 27th - October 3rd 2015, Hamburg, Germany
10. **A. Mantoan**, F. Spolaor, E. Ceseracciu, Z. Sawacha, M. Reggiani, Estimation of muscle forces based on a multi-DOF EMG-driven neuromusculoskeletal modeling approach: Impact of different EMG normalization strategies, *Gait & Posture* 42, Supplement 2, S2, September 2015
11. **A. Mantoan**, E. Ceseracciu, F. Spolaor, Z. Sawacha, M. Reggiani, On the effects of EMG normalization in muscle forces estimation when using a multi-DOF EMG-driven neuromusculoskeletal model, *XV International Symposium on Computer Simulation in Biomechanics*, July 9th – 11th 2015, Edinburgh, UK
12. **A. Mantoan**, Towards the application of multi-DOF EMG-driven neuromusculoskeletal modeling in clinical practice: methodological aspects, PhD Thesis, January 2015
13. **A. Mantoan**, M. Reggiani, Z. Sawacha, C. Pizzolato, M. Sartori, and C. Cobelli, A new Matlab toolbox to process C3D data files for application in OpenSim, XIV Congresso Nazionale SIAMOC, Pisa, September 26th - 28th 2013
14. **A. Mantoan**, M. Reggiani, M. Sartori, Z. Sawacha, C. Pizzolato, and C. Cobelli, A Matlab generic tool to efficiently process C3D files for applications in OpenSim, XXIV Congress of the International Society of Biomechanics, Natal-Rio Grande do Norte, Brazil, August 4th - 9th 2013
15. **A. Mantoan**, M. Reggiani, M. Sartori, C. Pizzolato, Z. Sawacha and C. Cobelli, A Matlab Platform to efficiently process kinematic and kinetic data for application in OpenSim, 2013 Annual Conference of GCMAS, Cincinnati, Ohio, May 14th - 17th 2013
16. A. Rigato, Z. Sawacha, S. Fantozzi, F. Pretto, **A. Mantoan**, M. Cortesi, S. Del Din, G. Gatta, C. Cobelli, Underwater Gait Analysis: A Markerless Approach, *Gait & Posture*, Volume 38, Supplement 1, S113, 2013

17. **A. Mantoan**, M. Reggiani, E. Ceseracciu, M. Sartori, Z. Sawacha, F. Spolar, and C. Cobelli, Discovering muscle relevance for locomotion modes identification through machine learning techniques, III Congresso del Gruppo Nazionale di Bioingegneria, Roma, June 26th - 29th 2012
18. **A. Mantoan**, M. Cortesi, E. Ceseracciu, Z. Sawacha, S. Fantozzi, G. Gatta, C. Cobelli, Underwater markerless gait analysis: a pilot study, *Gait & Posture*, Volume 36, Supplement 1, S78-S79, June 2012
19. **A. Mantoan**, M. Cortesi, E. Ceseracciu, Z. Sawacha, S. Fantozzi, G. Gatta, C. Cobelli, Markerless Gait Analysis: An Underwater Pilot Study, *Gait & Posture*, Volume 35, Supplement 1, S4, April 2012

Oral Presentations

- ARC-Intellicare, A home-based platform for an integrated rehabilitation care: the Italian case study, III International Clinical Engineering and Health Technology Management Congress (ICEHTMC), October 21st - 22nd, 2019, Rome, Italy
- On the effects of EMG normalization in muscle forces estimation when using a multi-DOF EMG-driven neuromusculoskeletal model, XV International Symposium on Computer Simulation in Biomechanics, July 9th - 11th, 2015, Edinburgh, UK
- A Matlab Platform to efficiently process kinematic and kinetic data for application in OpenSim, 2013 Annual Conference of GCMAS, Cincinnati, Ohio, May 14th - 17th 2013
- Markerless Gait Analysis: An Underwater Pilot Study, XII SIAMOC Congress, Bosisio Parini (LC), September 28th - October 1st 2011

Languages

Italian (Mothertongue), English (C1)

Awards

- 2019 3rd best paper at ICEHTMC, within the session *Technologies for home care*
- 2017 PhD-ITalents (https://www.phd-italents.it/)
- 2013 GCMAS Student Travel Award