

# ELEONORA MONTAGNANI

Post-Doctoral Research Fellow

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## RESEARCH INTERESTS

Locomotion, Neuromotor Control, Human Motion Analysis, Motor impairment, Motor Learning, Motion Capture, Postural Balance, Developmental Biomechanics, Variability, Computational Biomechanics, Biomechanical image processing techniques, Pedobarographic Statistical Parametric Mapping, Atypical motor development.

## RESEARCH EXPERIENCES

DECEMBER 2022 – PRESENT

**POST DOCTORAL RESEARCH FELLOW**, CHILDREN'S HOSPITAL LOS ANGELES, INFANT NEUROMOTOR CONTROL LABORATORY, UNIVERSITY OF SOUTHERN CALIFORNIA, UNITED STATES

Tasks: Research projects development with infants at risk of neurodevelopmental disabilities and infants with Spinal Muscular Atrophy, grant writing, undergraduate mentorship, IMU sensors data analysis, EEG data collection assistance and analysis in infants with typical development and visually impaired, papers writing.

Advisor: Dr. Beth Ann Smith

OCTOBER 2022 – DECEMBER 2023

**RESEARCH ASSISTANT**, UNIVERSITY OF SALFORD, UNITED KINGDOM

Tasks: Analysis of kinematic, plantar pressure, EMG data. Papers writing, PhD students' assistance.

APRIL 2018 – DECEMBER 2018

**ASSISTANT DATA COLLECTION**, UNIVERSITY OF BRIGHTON, UNITED KINGDOM

Tasks: Development of recruitment and data collection strategies in infancy, assistance in collection and analysis of kinematic, EMG, ultrasound, pH and plantar pressure data.

## EDUCATION

**MARCH 2019 – OCTOBER 2022**

**PHD IN BIOMECHANICS**, UNIVERSITY OF BRIGHTON, DEPARTMENT OF HEALTH SCIENCES, UNITED KINGDOM

*Thesis title:* Analysis of plantar pressures to explore real-world functional characteristics and development of the infant weight-bearing foot.

*Thesis topic:* Implementing high resolution methodological approaches for analysis of 2-dimensional plantar pressure to investigate foot-ground interactions as infants learn how to walk confidently

Advisors: Dr. Carina Price, Dr. Stewart Morrison

**FEBRUARY 2018 – MARCH 2019**

**MASTER OF SCIENCE DEGREE**, UNIVERSITY OF BRIGHTON, DEPARTMENT OF HEALTH SCIENCES, UNITED KINGDOM

*Thesis title:* Descriptive analysis of variability in foot loading during dynamic supported standing in infants.

*Modules undertaken:* Research Methods in Health Care (20 CFU), Pharmacology (20 CFU), Off-loading methods for at risks patients of metabolic, rheumatic and neurological disorders (20 CFU), Musculoskeletal biomechanics (20 CFU), Analysis of function (20 CFU), Pediatrics (20 CFU), Dissertation module (60 CFU).

Advisors: Dr. Stewart Morrison, Dr. Juliet McClymont

**SEPTEMBER 2013 – NOVEMBER 2016**

**BACHELOR OF SCIENCE IN PODIATRY**, UNIVERSITY OF GENOA, SCHOOL OF MEDICAL SCIENCES AND REHABILITATION, ITALY

*Thesis title:* Clinical foot management of patients affected by psoriatic arthritis.

Advisor: Prof. Marco Cimmino, MD

## SKILLS

- Quantitative data analysis
- Analytical skills
- Academic writing
- Teamwork
- EEG computer operator
- IBM SPSS statistics
- Matlab
- Python
- Computational analyses
- Problem solving

## LANGUAGES

*Italian:* Mother tongue

*English:* Proficient in both oral and written

*Spanish:* Limited working knowledge

## GRANTS AND AWARDS

### 1. **BEST START TO LIFE RESEARCH GRANT** – April 2023 (3K)

*Funding agency:* Children's Hospital Los Angeles  
*Secondary institution:* University of Southern California

*Research title:* Investigation of movement patterns in infants at risk of neurodevelopmental disabilities using wearable sensors.

### 2. **EARLY CAREER RESEARCH AWARD** – (in phase of approval) (25K)

*Funding agency:* The Thrasher Foundation  
*Secondary Institution:* Children's Hospital Los Angeles

*Research title:* Wearable sensors to study postures and movement patterns in infants with Spinal Muscular Atrophy.

## PROJECTS PARTICIPATION

### FEBRUARY 2018 – DECEMBER 2022

#### **THE GREAT FOUNDATIONS PROJECT (1.5M)**

*Scope of the project:* A collaborative initiative led by the Universities of Salford and Brighton to study changes in gait kinematics, plantar pressures, lower limb EMG, and foot skin modifications across stages of infancy.

### JANUARY 2023 – PRESENT

#### **THE EMERGENCE OF ARM REACHING AND LATERALIZATION OF MOTOR CONTROL IN INFANCY**

*Scope of the project:* A project led by Dr. Beth A Smith at Children's Hospital Los Angeles to study Using EEG and IMU to study changes in brain activity and motor control as infants learn to reach for objects.

## PUBLICATIONS

### Peer reviewed articles:

1. **Montagnani, E.,** Price, C., Nester, C., & Morrison, S. C. (2021). Dynamic characteristics of foot development: A narrative synthesis of plantar pressure data during infancy and childhood. *Pediatric Physical Therapy, 33*(4), 275-282
2. **Montagnani, E.,** Morrison, S. C., Varga, M., & Price, C. (2021). Pedobarographic Statistical Parametric Mapping of plantar pressure data in new and confident walking infants: A preliminary analysis. *Journal of Biomechanics, 129*, 110757.
3. Price, C., Montagnani, E., Santos, A. M., Nester, C., & Morrison, S. (2022). Longitudinal study of foot pressures during real-world walking as infants develop from new to confident walkers. *Gait & Posture, 92*, 351-358.

4. Russo, L., **Montagnani, E.**, Buttari, D., Ardigò, L. P., Melenco, I., Larion, A., ... & Padulo, J. (2022). Track Running Shoes: A Case Report of the Transition from Classical Spikes to “Super Spikes” in Track Running. *Applied Sciences*, 12(20), 10195.
5. Russo, L., **Montagnani, E.**, Pietrantuono, D., D’Angona, F., Fratini, T., Di Giminiani, R., ... & Padulo, J. (2023). Self-Myofascial Release of the Foot Plantar Surface: The Effects of a Single Exercise Session on the Posterior Muscular Chain Flexibility after One Hour. *International Journal of Environmental Research and Public Health*, 20(2), 974.
6. **Montagnani, E.**, Morrison, S. C., & Price, C. (2023). Masking approaches to analyse plantar pressure data of new and confident walking infants. *Gait & Posture*, 102, 93-99.
7. Russo L, Belli G, Di Blasio A, Lupu E, Larion A, Fischetti F, **Montagnani, E.**, Di Biase Arrivabene P, De Angelis M. The Impact of Nordic Walking Pole Length on Gait Kinematic Parameters. (2023) *Journal of Functional Morphology and Kinesiology*. 8(2):50.
8. Price, C., **Montagnani, E.**, Nester, C., & Morrison, S. C. (2023). Foot plantar pressure and centre of pressure trajectory differ between straight and turning steps in infants. *Scientific Reports*, 13(1), 7941.
9. **Montagnani E.**, Bradley H., Smith BA., (2023): Gait characteristics and development in infants with visual disorders: where do we stand and where are we going? *Journal of Visual Impairment and Blindness* (Under review).

#### **Conference papers:**

1. **Montagnani E.**, Morrison SC., Nester C., Price C., (2021): A preliminary analysis of plantar pressure data in infants at the onset of walking and confidently walking using pedobarographic statistical parametric mapping (pSPM). *International Foot and Ankle Biomechanics Conference*, Sao Paulo, Brazil.
2. **Montagnani E.**, Morrison SC., Price C., (2022): A vector field analysis to investigate foot-ground interactions in infancy during walking. 27<sup>th</sup> Congress of the European Society of Biomechanics, June 26-29, Porto, Portugal.

#### **Poster presentation:**

1. **Montagnani E.**, Morrison SC., Nester C., Price C., (2021): The transition from non-weight bearing to independent walking: understanding the role of the foot in the development of walking. 6th Lancaster International Conference on Infant and Early Child Development, Lancaster University
2. **Montagnani E.**, Bradley H., Smith BA., (2023): Gait characteristics and development in infants with visual disorders: where do we stand and where are we going? *Children Hospital Science Day*, University of Southern California, United States.

#### **Papers under review:**

2. **Montagnani E.**, Bradley H., Smith BA., (2023): A narrative review of gait characteristics and development in infants with visual disorders: where do we stand and where are we going? *Journal of visual impairments and blindness*.

## **MEMBERSHIPS AND CONFERENCE ATTENDANCES**

Member of the International Society of Biomechanics (ISB)

Member of the European Society of Biomechanics (ESB)

Presenter at the 6th Lancaster International Conference on Infant and Early Child Development, Lancaster University, August 2021.

Selected speaker at the first Journal Club held by the European Society of Biomechanics, March 2022.

Speaker at the 27<sup>th</sup> Congress of the European Society of Biomechanics, June 2022.

## **CURRENT JOURNAL ROLES**

### **Peer reviewer for:**

Journal of Foot and Ankle Research, PLoS ONE, Journal of the Royal Society Interface