

4. Part B2 Section 4 - CV of the researcher**PERSONAL INFORMATION**

Family name, First name: ARVANITIDIS, MICHAEL

Researcher unique identifier(s): [0000-0002-3339-6668](#)

Date of birth: 21/11/1993

URL of websites: [Google Scholar](#); [ResearchGate](#); [LinkedIn](#)**PROFESSIONAL EXPERIENCE**

27/09/2024 – Present	Post-doctoral Fellowship Centre of Precision Rehabilitation for Spinal Pain (CPR Spine), School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, University of Birmingham, Birmingham, UK. Mentor: Prof. Deborah Falla. Project: ‘ <i>Cervical in Space</i> ’ - Cervical spine and muscle adaptation after spaceflight and relationship to herniation risk
26/09/2022 – 26/09/2024	Pre-doctoral Fellowship CPR Spine, School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, University of Birmingham, Birmingham, UK. Mentor: Prof. Deborah Falla. Project: ‘ <i>Cervical in Space</i> ’ - Cervical spine and muscle adaptation after spaceflight and relationship to herniation risk
22/02/2021 – 12/08/2022	Pre-doctoral Fellowship CPR Spine, School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, University of Birmingham, Birmingham, UK. Mentor: Prof. Deborah Falla. Project: ‘ <i>Cervical in Space</i> ’ - Cervical spine and muscle adaptation after spaceflight and relationship to herniation risk
01/06/2018 -Present	Specialist Musculoskeletal Physiotherapist (Part-time) The Birmingham Back Pain Clinic, Birmingham, UK. Employer: Dr David W. Evans
07/11/2016 – 31/08/2017	Musculoskeletal Physiotherapist Private Physiotherapy Centre, Drama, Greece. Employer: Mr Panagiotis Gklavopoulos

EDUCATION

02/02/2019 – 26/09/2024	Doctor of Philosophy (Ph.D. in Sport, Exercise and Rehabilitation Sciences) CPR Spine, School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, University of Birmingham, Birmingham, UK. Funded scholarship: “ Control of Trunk Muscle Force in Individuals with Low Back Pain: New Insights Revealed by High-Density Surface Electromyography ”. Supervisors: Dr Eduardo Martinez-Valdes, Prof. Deborah Falla
14/09/2017 – 07/02/2019	Master of Science (MSc Advanced Manipulative Physiotherapy) School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, University of Birmingham, Birmingham, UK. Supervisors: Dr Eduardo Martinez-Valdes, Prof. Deborah Falla
29/09/2011 – 26/11/2025	BSc Physiotherapy (First Class Honours) Department of Physiotherapy, University of Thessaly, Lamia, Greece. Supervisor: Prof. Georgios Giotfos

CONTRIBUTIONS TO SCIENCE WITH LIST OF PEER-REVIEWED PUBLICATIONS

1. **Arvanitidis M**, Falla D, Negro F, Boccia G, Rainoldi A, Martinez-Valdes E. Reduced knee extensor torque steadiness and increased motor unit discharge variability in young people with patellofemoral knee pain: a pilot study. *Eur J Appl Physiol.* 2025, **Under Review**. (Scientific impact: Provided novel insights into the neuromuscular impairments associated with patellofemoral knee pain during single-joint exercises).
2. Contreras-Hernandez I, Falla D, **Arvanitidis M**, Negro F, Jimenez-Grande D, Martinez-Valdes E. Eccentric and concentric torque feedback training induce similar clinical improvements but distinct triceps surae motor unit adaptations in non-insertional Achilles tendinopathy: a randomized controlled trial. *medRxiv*. [doi: 10.1101/2025.06.20.25330016], *J Sport Health Sci.* 2025, **Under Review**. (Scientific impact: Demonstrated for the first time that eccentric and concentric torque feedback training produce similar clinical improvements, but

- distinct neuromechanical adaptations in individuals with Achilles tendinopathy). **Role: Data collection, analysis and interpretation.**
3. Sageshima H, Parrella M, **Arvanitidis M**, Devecchi V, Falla D. Does pain alter the spatial distribution of muscle activity in people experiencing spinal pain? A systematic review and meta-analysis. *J Electromyogr Kinesiol.* 2025, **Under Review.** (**Scientific impact:** This review revealed significant regional differences in lumbar erector spinae activity in people with spinal pain, highlighting new opportunities to design targeted interventions for specific muscle regions). **Role: Supervision, manuscript revision**
 4. Parrella M, **Arvanitidis M**, Macaluso A, Falla D. The effects of ageing on fatigue and endurance of the spinal extensor muscles: A systematic review and meta-analysis. *GeroScience.* 2025, **Under Review.** (**Scientific impact:** First systematic review and meta-analysis to demonstrate that older adults have reduced trunk muscle endurance compared to younger adults, advancing understanding of age-related neuromuscular decline). **Role: Meta-analysis and results interpretation.**
 5. Parrella M, Borzuola R, Siciliano FP, **Arvanitidis M**, Nuccio S, Falla D, Piacentini MF, Macaluso A. Fatigue-induced alterations in the spatial distribution of lumbar erector spinae activity in older versus young adults. *Eur J Appl Physiol.* 2025. [doi: 10.1007/s00421-025-05864-5]. (**Scientific impact:** First study to demonstrate age-related differences in the spatial distribution of lumbar erector spinae activation under fatigue, providing new insights into trunk neuromuscular adaptations in ageing). **Role: Data analysis and interpretation.**
 6. **Arvanitidis M**, Mak HHK, Martinez-Valdes E, Barbero M, Falla D. Validation of a Novel device for Assessing Neck Muscle Strength. *Arch Physiother.* 2025;15:148-157. [doi: 10.33393/aop.2025.3476]. (**Scientific impact:** Demonstrated that the NOD is a valid and reliable handheld device for assessing neck muscle strength, offering a portable and affordable alternative to laboratory-based dynamometry).
 7. Devecchi V, **Arvanitidis M**, Falla D. Effects of microgravity on neuromuscular control of the spine: a protocol for a systematic review and meta-analysis. *BMJ Open.* 2025;15(6):e098172. [doi: 10.1136/bmjopen-2024-098172]. (**Scientific impact:** This work will provide novel insights into how microgravity affects spinal neuromuscular control and inform the development of countermeasures to reduce spinal pain and injury risk in astronauts). **Role: Second reviewer (screening, risk of bias assessment, feedback).**
 8. Contreras-Hernandez I, Falla D, **Arvanitidis M**, Negro F, Jimenez-Grande D, Martinez-Valdes E. Load and muscle-dependent changes in triceps surae motor unit firing properties in individuals with non-insertional Achilles tendinopathy. *J Physiol.* 2025. [doi: 10.1113/JP287588]. (**Scientific impact:** First study to demonstrate load- and muscle-dependent changes in triceps surae motor unit firing properties, torque relationships, and neural drive distribution in individuals with non-insertional Achilles tendinopathy, highlighting a central role of the lateral gastrocnemius in the pathophysiology of the condition). **Role: Data analysis and interpretation.**
 9. Selvamoorthy R, **Arvanitidis M**, Negro F, Pincheira P, Evans D, Martinez-Valdes E. Torque visuomotor feedback training versus standard eccentric exercise for the management of patellar tendinopathy: protocol for a randomised controlled trial. *BMJ Open.* 2025;15(2):e092104. [doi: 10.1136/bmjopen-2024-092104]. (**Scientific impact:** First study to test torque-based visual feedback training for patellar tendinopathy, assessing both clinical outcomes and quadriceps neuromuscular/tendon adaptations). **Role: Data analysis, supervision.**
 10. **Arvanitidis M**, Falla D, Sanderson A, Martinez-Valdes E. Does pain influence control of muscle force? A systematic review and meta-analysis. *Eur J Pain.* 2025;29(2):e4716. [doi: 10.1002/ejp.4716]. (**Scientific impact:** Demonstrated that force steadiness is impaired in people experiencing musculoskeletal pain, highlighting its relevance as a rehabilitation target).
 11. Contreras-Hernandez I, **Arvanitidis M**, Falla D, Negro F, Martinez-Valdes E. Achilles tendon morpho-mechanical parameters are related to triceps surae motor unit firing properties. *J Neurophysiol.* 2024;132(4):1198-1210. [doi: 10.1152/jn.00391.2023]. (**Scientific impact:** Demonstrated a novel link between motor unit firing behaviour and Achilles tendon mechanical properties, highlighting the interaction between neural drive and muscle-tendon function). **Role: Data collection and analysis.**
 12. Corvini G, **Arvanitidis M**, Falla D, Conforto S. Novel Metrics for High-Density sEMG Analysis in the Time-Space Domain During Sustained Isometric Contractions. *IEEE Open J Eng Med Biol.* 2024;5:760-768. [doi: 10.1109/OJEMB.2024.3449548]. (**Scientific impact:** Introduced novel HD-sEMG spatial metrics to characterize fatigue-related neuromuscular adaptations and demonstrated their potential to predict muscle endurance). **Role: Data collection and interpretation.**
 13. **Arvanitidis M**, Jiménez-Grande D, Haouidji-Javaux N, Falla D, Martinez-Valdes E. Eccentric exercise-induced delayed onset trunk muscle soreness alters high-density surface EMG-torque relationships and lumbar kinematics. *Sci Rep.* 2024;14(1):18589. [doi: 10.1038/s41598-024-69050-x]. (**Scientific impact:** First study to

- explore how delayed-onset muscle soreness influences trunk HDsEMG–torque relationships and lumbar kinematics, showing adaptive motor strategies despite preserved torque steadiness).
14. Deane J, **Arvanitidis M**, Briggs M, Falla D, Johnson M. Evaluating the efficacy of wearable biofeedback on the outcomes of exercise interventions in people with chronic non-specific spinal pain: protocol for a systematic review and meta-analysis. *BMJ Open*. 2024;14(7):e085206. [doi: 10.1136/bmjopen-2024-085206]. (Scientific impact: It will provide novel insights into wearable feedback technology to enhance exercise interventions for chronic spinal pain, informing future clinical practice guidelines). **Role: Second reviewer.**
 15. **Arvanitidis M**, Jiménez-Grande D, Haouidji-Javaux N, Falla D, Martinez-Valdes E. Low Back Pain-Induced Dynamic Trunk Muscle Control Impairments Are Associated with Altered Spatial EMG-Torque Relationships. *Med Sci Sports Exerc*. 2024;56(2):193-208. [doi: 10.1249/MSS.0000000000003314]. (Scientific impact: Showed for the first time that people with chronic low back pain have impaired torque steadiness and altered HDsEMG-torque relationships during dynamic trunk flexion and extension contractions, highlighting torque steadiness and biofeedback as potential rehabilitation targets).
 16. Valencia O, Weinstein A, Salas R, Guzmán-Venegas R, **Arvanitidis M**, Martinez-Valdes E. Temporal differences in the myoelectric activity of lower limb muscles during rearfoot and forefoot running: A statistical parametric mapping approach. *Eur J Sport Sci*. 2023;23(6):983-991. [doi: 10.1080/17461391.2022.2081094]. (Scientific impact: Showed that forefoot and rearfoot running techniques alter shank but not thigh muscle activity, providing novel insights into neuromuscular control strategies that may inform injury prevention and training approaches in runners). **Role: Manuscript drafting and review.**
 17. Tsimouris D, **Arvanitidis M**, Moutzouri M, Koumantakis GA, Gioftsos G, Papandreou M, Grammatopoulou E. Is manual therapy of the diaphragm effective for people with obstructive lung diseases? A systematic review. *Respir Med Res*. 2023;83:101002. [doi: 10.1016/j.resmer.2023.101002]. (Scientific impact: Provided preliminary evidence that manual therapy targeting the diaphragm's zone of apposition can improve diaphragm excursion, chest expansion, and exercise capacity in people with obstructive lung disease, highlighting the need for further trials). **Role: Second reviewer, involved in manuscript review and editing.**
 18. **Arvanitidis M**, Jiménez-Grande D, Haouidji-Javaux N, Falla D, Martinez-Valdes E. People with chronic low back pain display spatial alterations in high-density surface EMG-torque oscillations. *Sci Rep*. 2022;12(1):15178. [doi: 10.1038/s41598-022-19516-7]. (Scientific impact: Used a novel HDsEMG-based approach to overcome decomposition challenges in the lumbar erector spinae and showed that people with chronic low back pain exhibit altered sEMG–torque relationships and compensatory activation strategies).
 19. Belavy DL, Armbrrecht G, Albracht K, Brisby H, Falla D, Scheuring R, Sovellius R, Wilke HJ, Rennerfelt K, Martinez-Valdes E, **Arvanitidis M**, Goell F, Braunstein B, Kaczorowski S, Karner V, Arora NK. Cervical spine and muscle adaptation after spaceflight and relationship to herniation risk: protocol from “Cervical in Space” trial. *BMC Musculoskelet Disord*. 2022;23(1):772. [doi: 10.1186/s12891-022-05684-0]. (Scientific impact: Astronauts have a markedly higher risk of cervical disc herniation, yet underlying mechanisms remain unexplored. This international project will provide novel insights into cervical spine adaptations after spaceflight and inform preventive strategies for astronauts, with broader implications for understanding neck pain on Earth). **Role: data collection, analysis and interpretation.**
 20. Martinez-Valdes E, Negro F, **Arvanitidis M**, Farina D, Falla D. Pain-induced changes in motor unit discharge depend on recruitment threshold and contraction speed. *J Appl Physiol*. 2021;131(4):1260-1271. [doi: 10.1152/jappphysiol.01011.2020]. (Scientific impact: Showed that pain affects motor unit behavior differently across contraction speeds, advancing understanding of how nociceptive inputs influence motor control and providing insights relevant for rehabilitation of motor impairments). **Role: data analysis.**
 21. Varrecchia T, Ranavolo A, Conforto S, De Nunzio AM, **Arvanitidis M**, Draicchio F, Falla D. Bipolar versus high-density surface electromyography for evaluating frequency-dependent lifting activities. *Appl Ergon*. 2021;95:103456. [doi: 10.1016/j.apergo.2021.103456]. (Scientific impact: Showed that HDsEMG provides earlier and more accurate discrimination of biomechanical risk during fatiguing lifting than traditional sEMG, supporting its use as an advanced tool for monitoring fatigue and preventing work-related low back pain). **Role: data collection.**
 22. **Arvanitidis M**, Falla D, Sanderson A, Martinez-Valdes E. Does pain influence force steadiness? A protocol for a systematic review. *BMJ Open*. 2021 Jan 8;11(1):e042525. [doi: 10.1136/bmjopen-2020-042525]. (Scientific impact: same as [9]).
 23. **Arvanitidis M**, Bikinis N, Petrakis S, Gkioka A, Tsimplis D, Falla D, Martinez-Valdes E. Spatial distribution of lumbar erector spinae muscle activity in individuals with and without chronic low back pain during a dynamic isokinetic fatiguing task. *Clin Biomech*. 2021;81:105214. [doi: 10.1016/j.clinbiomech.2020.105214].

(**Scientific impact:** Provided novel insights into neuromuscular responses during dynamic fatigue, showing that people with chronic low back pain display altered and potentially less efficient activation of the lumbar erector spinae).

24. **Arvanitidis M**, Falla D, Martinez-Valdes E. Can visual feedback on upper trapezius high-density surface electromyography increase time to task failure of an endurance task? *J Electromyogr Kinesiol.* 2019;49:102361. [doi: 10.1016/j.jelekin.2019.102361]. (**Scientific impact:** First study to explore whether humans can selectively modify trapezius muscle activity using HDsEMG visual feedback and whether this ability relates to endurance time).
25. Gifftos G, **Arvanitidis M**, Tsimouris D, Kanellopoulos A, Paras G, Trigkas P, Sakellari V. EMG activity of the serratus anterior and trapezius muscles during the different phases of the push-up plus exercise on different support surfaces and different hand positions. *J Phys Ther Sci.* 2016;28(7):2114-8. [doi: 10.1589/jpts.28.2114]. (**Scientific impact:** Examined how support surface stability, hand positioning, and exercise phase influence trapezius and serratus anterior activation during push-up plus, providing evidence to refine exercise prescription for improving scapular stability in rehabilitation). **Role: data collection, analysis and interpretation.**

PUBLICATIONS IN PREPARATION

1. **Arvanitidis M**, Contreras I, Negro F, Martinez-Valdes E. Assessing the interplay between neural drive and muscle contraction dynamics during postural tasks in older individuals. What are the mechanisms responsible for a decline in the control of ankle joint force? *J Physiol.*
2. Parrella M, **Arvanitidis M**, Borzuola R, Jiménez-Grande D, Macaluso A, Falla D. Age-related differences in EMG-force coherence of the trunk extensor muscles. *Sci Rep.*
3. Sageshima H, River Y, Sidiropoulos G, **Arvanitidis M**, Falla D. The effect of eccentric exercise-induced delayed onset on neck extensor muscle function. *Sci Rep.*
4. Selvamoorthy R, Negro F, Jiménez-Grande D, **Arvanitidis M**, Evans D, Pincheira P, Martinez-Valdes E. Knee extensor motor unit firing dynamics in relation to patellar tendon stiffness. *J Neurophysiol.*

Refereed Conference Proceedings (oral – selection) (Asterisks (*) signify the presenter)

1. Parrella M*, Borzuola R, Siciliano F.P, **Arvanitidis M**, Nuccio S, Jiménez-Grande D, Falla D, Piacentini M.F, Macaluso A. Does older age affect high-density EMG force coherence of the lumbar erector spinae during fatigue? 30th Annual Congress of the European College of Sport Science. July 1-4, 2025. [Scientific Programme](#)
2. Parrella M*, Borzuola R, Siciliano F.P, **Arvanitidis M**, Nuccio S, Falla D, Piacentini M.F, Macaluso A. Fatigue-induced alterations in the spatial distribution of lumbar erector spinae muscle activity in older versus young adults. 29th Annual Congress of the European College of Sport Science. July 2-5, 2024. [Abstract Booklet](#)
3. **Arvanitidis M***, Jiménez-Grande D, Haouidji-Javaux N, Falla D, Martinez-Valdes E. Associations between delayed onset trunk muscle soreness, altered EMG-torque relationships, and lumbar kinematics in dynamic contractions. XXV Congress of the International Society of Electrophysiology and Kinesiology. June 26-29, 2024. [Abstract Booklet](#)
4. Martinez-Valdes E*, Jiménez-Grande D, **Arvanitidis M**, Falla D, Farina D, Jenkinson N, Negro F. Changes in cortical beta inputs to spinal motoneurons during the acquisition and retention of a new visuomotor skill task. XXV Congress of the International Society of Electrophysiology and Kinesiology. June 26-29, 2024.
5. **Arvanitidis M***, Jiménez-Grande D, Haouidji-Javaux N, Falla D, Martinez-Valdes E. Reduced lumbar extensor muscle torque steadiness is associated with increased activity of the lumbar erector spinae muscle during eccentric contractions in people with chronic low back pain. XXIV Congress of the International Society of Electrophysiology and Kinesiology. June 22-25, 2022. [Abstract Booklet](#)
6. **Arvanitidis M***, Bikinis N, Petrakis S, Gkioka A, Tsimpolis D, Falla D, Martinez-Valdes E. Effect of a dynamic isokinetic fatiguing task on the spatial distribution of erector spinae muscle activity in individuals with low back pain. XXIII Congress of the International Society of Electrophysiology and Kinesiology. July 12-14, 2020. [Abstract Booklet](#)
7. **Arvanitidis M***, Jiménez-Grande D, Haouidji-Javaux N, Falla D, Martinez-Valdes E. Lumbar extensor muscle isometric torque steadiness and torque-HDsEMG coherence is altered in individuals with chronic low back pain. XXVIII Congress of the International Society of Biomechanics. July 25-29, 2021. [Abstract Booklet](#)
8. Martinez-Valdes E*, Negro F, **Arvanitidis M**, Farina D, Falla D. Pain-induced Adjustments in Motor Unit Discharge Depend on Contraction Speed. XXVIII Congress of the International Society of Biomechanics. July 25-29, 2021. [Abstract Booklet](#)

Refereed Conference Proceedings (poster – selection) (Asterisks (*) signify the presenter)

1. **Arvanitidis M***, Falla D, Negro F, Boccia G, Rainoldi A, Martinez-Valdes E. Altered Motor Unit Behaviour and Torque Steadiness in Athletes with Patellofemoral Pain during Singl- and Multi-Joint Exercises. International MotoNeuron Society Meeting. July 8-11, 2025.
2. **Arvanitidis M**, Martinez-Valdes E, Falla D*. Evaluation of Neck Force Control and Neck Muscle Activation in Astronauts post Spaceflight. PAINWeek. September 3-6, 2024. [Abstract Booklet](#)
3. **Arvanitidis M***, Jiménez-Grande D, Haouidji-Javaux N, Falla D, Martinez-Valdes E. Associations between impaired dynamic trunk muscle control in people with chronic low back pain and altered spatial EMG-torque correlations. XXV Congress of the International Society of Electrophysiology and Kinesiology. June 26-29, 2024. [Abstract Booklet](#)
4. **Arvanitidis M***, Martinez-Valdes E, Falla D. Evaluation of Neck Force Control and Neck Muscle Activation in Astronauts post Spaceflight. XXV Congress of the International Society of Electrophysiology and Kinesiology. June 26-29, 2024. [Abstract Booklet](#)
5. Luigi Cerone G, **Arvanitidis M**, Sergi M*, Gazzoni M, Falla D. Design, development, and experimental validation of an augmented reality biofeedback system providing information about muscle activation through HD-sEMG. XXV Congress of the International Society of Electrophysiology and Kinesiology. June 26-29, 2024. [Abstract Booklet](#)
6. Contreras I*, **Arvanitidis M**, van Helden J, Falla D, Martinez-Valdes E. Morphological and mechanical properties of the Achilles tendon and their relationship with triceps surae motor unit firing properties during isometric contractions. XXIV Congress of the International Society of Electrophysiology and Kinesiology. June 22-25, 2022. [Abstract Booklet](#)
7. **Arvanitidis M***, Falla D, Martinez-Valdes E. Effect of high-density surface electromyography visual feedback on shoulder-abduction endurance: a pilot study. Physiotherapy UK. November 1-2, 2019. [Scientific Programme](#)

AWARDS

1. Level 2 CPD Award (£1,500), Musculoskeletal Association of Chartered Physiotherapists, 2024.
2. Level 2 Research Award (£1,500), Musculoskeletal Association of Chartered Physiotherapists, 2024.
3. Shortlisted for the Oral Student Presentation Awards, XXIV Congress of the International Society of Electrophysiology and Kinesiology. June 22-25, 2022.
4. International Federation of Manual and Musculoskeletal Physical Therapists Incorporated (IFOMPT) Travel Bursary Award (£500) from the Musculoskeletal Association of Chartered Physiotherapists, 2020.
5. Rewarded with an honorary fellowship by the National Scholarships Foundation for distinction in my BSc studies during the academic year 2011-2012 (1st year), University of Thessaly, Greece.

FUNDING

1. UK Space Agency (co-applicant), Project: Cervical spine and muscle adaptation after spaceflight and relationship to herniation risk. Award value: £97,000.00 (2025-2026), £486,183.00 (2022-2025) and £116,341.00 (2021-2022).
2. The Royal Society. Project: Real-time augmented reality feedback of muscle activity to enhance human performance. Award value: £11,907.00. Role: Contributed to the writing of the application, co-applicant.

TEACHING, SUPERVISING & MENTORING EXPERIENCE**Graduate and Undergraduate Teaching**

Graduate Teaching (Number of students in parentheses)

1. **Neuromuscular Adaptations to Training (Isokinetic Dynamometry & High-density Electromyography – Practical Lab Demonstrations):** February 2020 (28), 2021(30), 2022 (52), 2023 (34), 2024 (31), 2025 (29)
2. **Invited lecture**, MSc Advanced Physiotherapy, University of Thessaly, Greece: “*The role of High-density surface EMG in the assessment & treatment of Musculoskeletal Disorders: clinical applications*”. June 2021 (9), 2022 (11), 2023 (15), 2024 (14), 2025 (17)

Undergraduate Teaching (Number of students in parentheses)

1. **Analysis of Motor Performance (Isokinetic Dynamometry & High-density Electromyography):** November 2022 (90), 2023 (88), 2024 (92), 2025 (87)

Mentoring – Visiting Students from Europe

1. Martina Parrella (PhD), 2025-present – Trunk muscle function in ageing.
2. Georgios Sidiropoulos (PhD), 2024-present – Neck morphological characteristics and chronic neck pain.
3. Hirofumi Sageshima (PhD), 2024-present – Delayed-onset muscle soreness (DOMS) & neck muscle function.
4. Martina Sergi (MSc), 2022 – A novel system to provide real-time augmented reality (AR) visual feedback on vasti and lumbar erector spinae muscle HDsEMG during functional tasks.

Graduate and Undergraduate Student Co-Supervision & mentoring (PhD theses/dissertations)

1. **Dhruv Intwala** (MSc), 2025 – Exercise, inflammation, and musculoskeletal pain (systematic review).
2. **Rongda Zhang** (PhD), 2024-present – Machine vs. free-weight lower-limb resistance training neuromuscular adaptations.
3. **Anna Gray** (MSc), 2024 – Exercise effects on pain and force steadiness in neck pain.
4. **Cillian Worrall, Xuemin Jiang, Yu Zha** (MSc), 2023 – Effect of AR visual feedback on vasti HDsEMG activity on knee extension endurance in individuals with and without patellofemoral knee pain
5. **Shilpa Purushotham** (PhD), 2023–present – Lumbar erector spinae composition and trunk muscle function in chronic low back pain
6. **Hon Ken Mak** (BSc), 2022 – Validation of a novel device for the measurement of neck strength.
7. **Hoi Lau, Sara Lilley** (BSc), 2022: DOMS effects on neck muscle force and activity.
8. **Joseph Ford, Joel Nathan, Luci Owen** (BSc), 2022 – differences in trunk muscle force control and activity during isometric, concentric and eccentric contractions in individuals with and without chronic low back pain.

Graduate and Undergraduate student mentorship during their Research Placements

1. **Mayowa Akinnifesi** (MSc), 2024 – Training in HDsEMG and isokinetic dynamometry.
2. **William Price** (MSc), 2024 – Training in HDsEMG and systematic review methods.
3. **Lily Brewster** (BSc), 2023 – Training in systematic review methods.
4. **Sze Chan** (BSc), 2023 – Training in systematic review methods.

PROFESSIONAL SERVICE EXPERIENCE**Journal Peer reviewer**

Applied Psychophysiology and Biofeedback, BMC Musculoskeletal Disorders, Clinical Biomechanics, European Journal of Applied Physiology, European Spine Journal, Journal of Applied Biomechanics, Journal of Biomechanics, Journal of Electromyography and Kinesiology, Journal of Sports Sciences, Musculoskeletal Science and Practice, Occupational and Environmental Medicine, PLOS ONE, Scientific Reports.

Outreach activities

Patient and Public Involvement (PPI) meetings, University of Birmingham: engaged with individuals from our established CPR Spine list (people living with chronic spinal pain) through presentations and interactive discussions, integrating public feedback into the development of new studies (2019, 2020, 2021, 2022, 2023, 2024).

CERTIFICATIONS**Online courses**

1. **Supervised Machine Learning: Regression and Classification** (DeepLearning.AI), Stanford Online, 2025.
2. **R Programming** (Coursera), Johns Hopkins University, 2024.
3. **The Data Scientist's Toolbox** (Coursera), Johns Hopkins University, 2023.
4. **Certified Peer Reviewer Course**, Elsevier, 2021.
5. **Introduction to Programming with MATLAB** (Coursera), Vanderbilt University, 2019.

Seminars (in-person)

1. The Otago Exercise Programme (OEP) Leader Award (*“Prevent falls in older adults”*, 3-day seminar), Later Life Training Limited. Organised by the Department of Physiotherapy, University of Thessaly, 2015.

MEMBERSHIPS

1. International Society of Electromyography and Kinesiology (ISEK), 2020.
2. Musculoskeletal Association of Chartered Physiotherapists (MACP), 2019.
3. The Chartered Society of Physiotherapy (CSP), 2018.
4. Health and Care Professions Council (HCPC), 2018.
5. Panhellenic Association of Physiotherapists, 2016.

5. Capacity of the Participating Organisation(s)

5.1 Template table: *Overview of Participating Organisations*

Organisation role	PIC	Legal Entity Short Name	Academic organisation (Y/N)	Country	Name of Supervisor
<i>Beneficiary</i>					
ARISTOTLE UNIVERSITY OF THESSALONIKI	999895692	AUTh	Y	Greece	Eleutherios Kellis
<i>Secondments</i>					
UNIVERSITA DEGLI STUDI DI BRESCIA	999893946	UNIBS	Y	Italy	Francesco Negro
UNIVERSITY OF ESSEX	999856989	UESSEX	Y	United Kingdom	Luca Citi

5.2 Template table: *Capacity of the Participating Organisations*

Beneficiary: Aristotle University of Thessaloniki (AUTh), Greece	
<p>General description: The Aristotle University of Thessaloniki (AUTh) is the largest university in Greece and one of the largest in Southeastern Europe. Located in Thessaloniki, its main campus spans 33.4 hectares in the city centre.</p> <p>Aristotle University of Thessaloniki (AUTh) is a comprehensive university with 10 faculties and 40 schools spanning a wide range of disciplines, including health sciences (medicine, dentistry, pharmacy), engineering and technology, natural sciences, social sciences, law, humanities, and the arts. It has a large student body, with over 88,000 undergraduate and postgraduate students AUTh is a public institution with a strong international presence, participating in numerous international organisations and university networks. It has bilateral agreements with many higher education institutions globally and actively participates in the ERASMUS+ program for student and staff mobility.</p> <p>The university is committed to creating an inclusive and gender-sensitive academic environment, as evidenced by its Gender Equality Plan. AUTh also focuses on lifelong learning, offering courses and programs beyond traditional degree studies. The university is known for its vibrant cultural life and its contribution to research and innovation in Greece and beyond.</p>	
Role and profile of supervisor	<p>Eleftherios Kellis is a professor of Kinesiology at the Department of Physical Education and Sports Sciences of Serres at the Aristotle University of Thessaloniki, where he currently teaches kinesiology and biomechanics. His main research interests include the hamstring and trunk core muscle biomechanics, 3D ultrasound and related techniques and soccer injury biomechanics. He acts as reviewer for several scientific journals in the field of sport and exercise sciences. Many of his doctoral students serve now in academic or market positions in the field. He has been named best researcher of the Aristotle University of Thessaloniki, for the years 2014, 2015, 2016, 2019 and 2025. According to “Scopus”, as in May 2025, he has 164 publications in international scientific journals, 5644 references to his work and h-index 45. He is also ranked according to the annual assessment of Stanford of 2% best researchers worldwide (link) at number 167, in the subject area “sports sciences”. Prof. Kellis will train me in the use of ultrasound for assessment of muscle-tendon mechanical properties, as well as provide me with training outlined in Section B1, Page 5-</p>

	6.
Key research facilities, Infrastructure and Equipment	The Laboratory of Neuromechanics at AuTH is the only facility in Greece with the complete infrastructure required for this project (HDsEMG, ultrasound, isokinetic dynamometry, resistance training equipment) and offers an ideal environment for interdisciplinary training in ultrasound, EECs, and aging research.
Previous and current involvement in EU-funded research and training programmes/actions/projects	The host institution and supervisors have extensive experience in coordinating and contributing to EU, national, and privately funded projects, highlighting their strong track record in collaborative research and training. Examples include: (1) <i>HORIZON-HLTH-2023-STAYHLTH-01-01, COMFORTAGE</i> (Project ID 101137301), Partner (ongoing); (2) EU–National Co-funded Project <i>Pythagoras II</i> (n°80930), Main Coordinator (2004–2007); (3) <i>European Program of Physical and Sports Activity (ERASMUS PLUS)</i> (n°98904 PLUS), Collaborator (2021–2022); (4) <i>Prevention of Injury via Sport and Counseling (PROTECTS)</i> , ERASMUS PLUS (n°98076), Collaborator (2019–2022); and (5) <i>Fit for Life</i> (n°84816), Coordinator (2007–2011), funded by a private company.

Associated Partner, Secondment (S1): University of Brescia (UNIBS), Italy	
General description: The University of Brescia (UNIBS), founded in 1982, is a multidisciplinary institution with 8 departments covering medicine, engineering, law, and economics. It hosts ~15,000 students and 650 academic staff, offering a wide range of degree and doctoral programs. UNIBS has strong international orientation, with active participation in EU-funded projects (FP5–Horizon Europe) and over 140 ongoing national and international research projects.	
Role and profile of supervisor	<u>Prof. Francesco Negro</u> , Full Professor at the Department of Clinical and Experimental Sciences, is internationally recognised for pioneering signal processing algorithms to identify biomarkers of motor disability. He has published over 110 peer-reviewed papers (H-index 48; >8,750 citations), is active in societies such as ISEK and the Motoneuron Society, and has held a Marie Curie Fellowship (NeuralCon, 2016–2018). He is currently an ERC Consolidator Grant holder (INcEPTION). Prof. Negro will supervise my training on HDsEMG decomposition and the optimisation of algorithms for older (particularly female) adults.
Key research facilities, Infrastructure and Equipment	The Neuromechanics and Motor Control and the INcEPTION Laboratories of the Department of Clinical and Experimental Sciences are equipped with motion tracking systems, HDsEMG amplifiers, ergometers, force measurement devices, TMS, FES, rehabilitation robotics, and multi-DOF prostheses. This environment will allow me to observe advanced applications of these techniques in ongoing experiments. In addition, Prof. Negro will provide access to extensive HDsEMG datasets, which, together with my own data, will be used to train me in advanced signal processing and computational methods for extracting and analysing motor unit spike trains in the unprecedented population investigated in my project.
Previous and current involvement in EU-funded research and training programmes/actions/projects	UNIBS is currently involved in almost 50 prestigious EU-funded projects, including: (1) ERC-2021-COG, INcEPTION, (2) ERC-2019-StG (2D4D), (3) MSCA-PF, MuDecomp, (4) MSCA-COFUND, Cultural Heritage Outreach in RomAnce Languages, (5) MSCA-DN, TOPCSP & ActaReBuild.

Associated Partner, Secondment (S2): University of Essex (UESSEX), United Kingdom	
General description: The School of Computer Science and Electronic Engineering (CSEE) at the University of Essex has an outstanding reputation for teaching and high-quality research in artificial intelligence, biomedical engineering, brain-computer interfaces, computer games, evolutionary computation, human language technology, robotics, networks and optoelectronics. Particularly relevant to this application is their research in statistical signal processing, machine learning and artificial intelligence and their applications in life and medical sciences.	
Role and profile of supervisor	Luca Citi is a (full) professor at the University of Essex. His research focuses on the application of AI, machine learning, statistics, and signal processing to biomedical and neural engineering problems. He has secured funding for £ 5.27M (of which over £ 3M as PI) for research in these areas. He will train and advise on the design, development and testing of the machine learning models.
Key research facilities, Infrastructure and Equipment	UESSEX offers cutting-edge computational infrastructure essential for large-scale data analysis and machine learning applications. In particular, the CERES cluster has 1096 processing cores (2192 with hyperthreading) provided by servers with a mix of Intel E5-2698, Intel Gold 5115, 6152 & 6238L processors, and between 500Gb & 6Tb RAM each. There are also 24 NVidia GTX & RTX Series GPU cards attached via dedicated GPU servers.
Previous and current involvement in EU-funded research and training programmes/actions/projects	UESSEX was and is involved in a large number of EU, UKRI, and charity-funded projects. In particular Prof. Citi participated in the following Horizon 2020 projects: “NEVERMIND” - (GA n°689691); “DeTOP” (GA n°687905); “POTION” (GA n°824153). He was WP leader for machine-learning related WPs in NEVERMIND and POTION.

6. Additional ethics information

Additional information that could not be included in Part A of the proposal (if needed).

7. Additional information on security screening

Additional information on security aspects that could not be included in Part A of the proposal (if needed).

8. Environmental considerations in light of the MSCA Green Charter

Please explain how the proposed project would strive to adhere to the MSCA Green Charter during its implementation.