



2027 Summer Research Project_Dr Lang 2

Section	Description
Project title	Clinical utility of low-cost, wireless programmable inertial measurement units in muscular training of lateral stepping balance in real-world settings.
Hours & delivery	20-30 hours / week January to February 2027 Hybrid Location (St Lucia in person for data collection, Flexible during planning)
About the project (150–250 words)	Reactive lateral stepping is a critical skill in maintaining balance in older adults. • Movement quality and the strength of hip abductors are two key measures that dictates lateral stepping. • While strengthen can be measured through dynamometry, how movement quality changes especially with fatigue is harder to measure and often conducted in a laboratory setting. • Movement quality is also often measured visually by the naked eye which is difficulty to validate and use as feedback in independent programs. • Laboratory equipment such as accelerometry and motion capture is bulking but provide more objective measurement. • The pervasiveness of more low-cost, programmable wireless inertial measurement units (IMU) may reduce the barrier to accessing quantitative movement quality data by the everyday clinician. • This project forms a larger body of work examining the clinical utility of these IMU in standardised the lateral stepping balance tasks such as single leg balance, sideling abduction holds, step reaction.
What you'll do (100-150 words)	• Assist in the development of the protocol and data collection for the study.
What you'll learn (100–150 words)	• Literature Review • Data collection in a clinical research setting • Data entry, cleaning and management • Skills in coding, using multi-axis accelerometry.
Project outcomes (75–125 words)	• Assist data collection in 10 participants on lateral stepping balance and movement variability. • Complete preliminary analysis towards further studies and/or write up.
Who should apply? (75–125 words)	This project is best suited for students undertaking a health, rehabilitation or biomedical program with a strong interest in anatomy and education. Experience in exercise training or balance and mobility training is not required but desirable. Interest in biomechanics and data-informed practice is recommended.



Students interested in understanding applied coding and data analysis I encouraged to apply.

Health students during 4th year placement year can apply, please contact supervisor for additional details.

Team & supervision
(75–125 words)

Project is supervised by Dr Ray Lang, lecturer in allied health anatomy at the School of Biomedical Sciences.

Students will be working with other researchers from the Motor Control Laboratory.

Additional opportunities
(optional)

Additional requirements
(if applicable)

Students will be required to complete the necessary onboarding and compliance processes. Students must follow all School safety procedures and maintain accurate records.

Contact

Students MUST contact the supervisor before applying due to the nature of study (human anatomy)

Direct enquiries to: Ray Lang r.lang@uq.edu.au