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Explainable Artificial Intelligence in Movement Sciences

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Propositions belonging to the thesis

Explainable Artificial Intelligence in Movement Sciences

Focusing on gait analysis in healthy older adults and patients with back pain

1. Deep learning surpasses traditional machine learning in the classification of age-related gait patterns using raw acceleration data. *(this thesis)*
2. Explainable artificial intelligence can enhance the understanding of the insights gained from machine learning models in gait analysis. *(this thesis)*
3. Changes in acceleration and deceleration patterns in gait due to aging can be recognized by machine learning. *(this thesis)*
4. The presence of central sensitization in patients with chronic low back pain may be associated with alterations in gait and physical activity patterns. *(this thesis)*
5. Variations in gait and physical activity patterns could reflect changes in motor control and pain response strategies in patients with chronic low back pain and central sensitization. *(this thesis)*
6. Due to the heterogeneity within the CLBP population, a tailored rehabilitation program maybe essential for effective treatment. *(this thesis)*
7. While deep learning offers superior learning capabilities, this comes at the cost of increased model complexity and reduced transparency. *(this thesis)*
8. Choosing the appropriate machine learning models for human movement analysis requires a trade-off between accuracy and explainability. *(this thesis)*
9. “知其然, 知其所以然” (Translated and simplified into English: Know what it is, know why it is) – attributed to **Zhu Xi**, Southern Song Dynasty.