Using Machine Learning to Quantify Transverse Plan Lumbopelvic Rhythm

Take-Home

- Lumbopelvic rhythm illustrates the relative motion between the lumbar spine and pelvis.
- Machine learning may be a viable solution in identifying clusters of patterns for healthy adults.
- Lumbopelvic movement patterns can potentially be used as a biomarker for low back pain (LBP).

80 healthy adults
(Young: n = 46; 18-40yr; Middle-Age: n = 33; 41-65yr)

Task: Maximal trunk rotation from right to left.

Analysis:
3D kinematics of the lumbar spine and pelvis
vector coding for lumbopelvic rhythm

K-means clustering (k = 3) to segment rhythm into clusters.

Results:
Lumbar spine and pelvis mostly moved in-phase.
For cluster 1, the start and end in anti-phase and cluster 2 and 3 started and ended in-phase.
Age differences were seen only in cluster 1.

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