

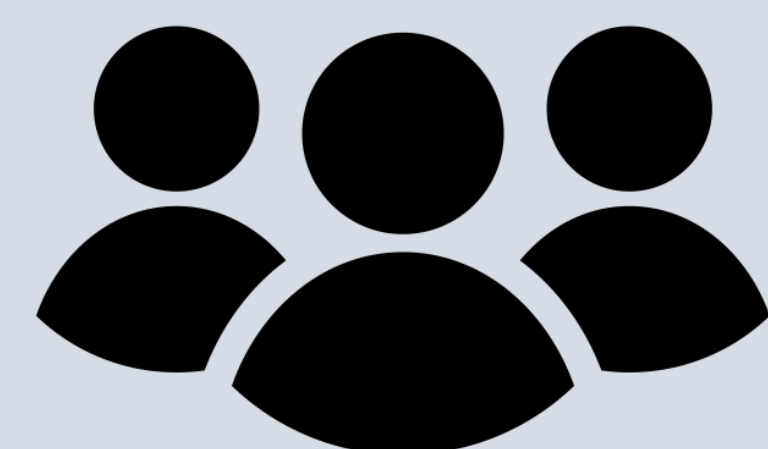
## Take-Home

- 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 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:

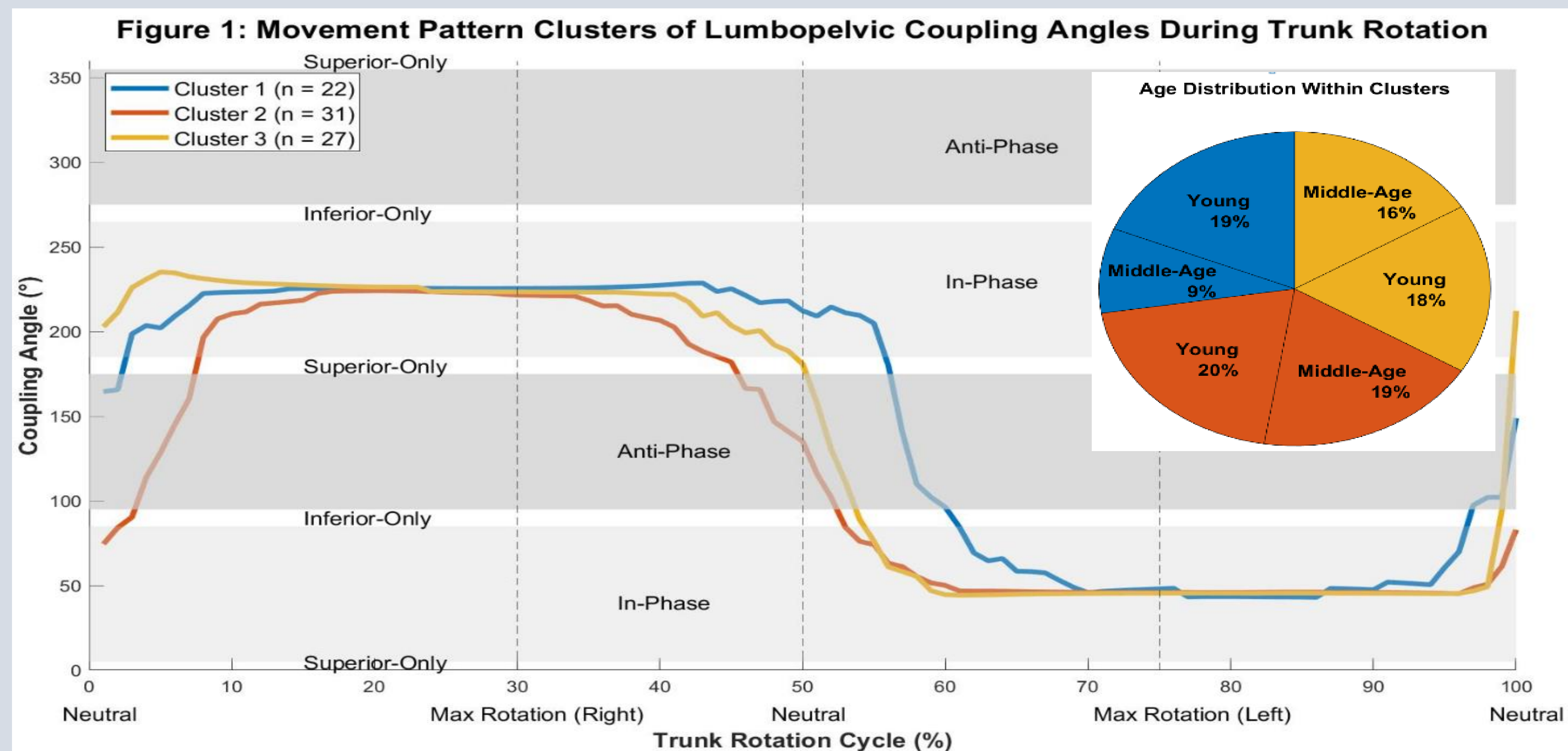
3D kinematics of the lumbar spine and pelvis



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