

# Athletes With High Knee Abduction Moments Show Increased Vertical Center of Mass Excursions And Knee Valgus Angles Across Sport-Specific Fake-And-Cut Tasks of Different Complexities

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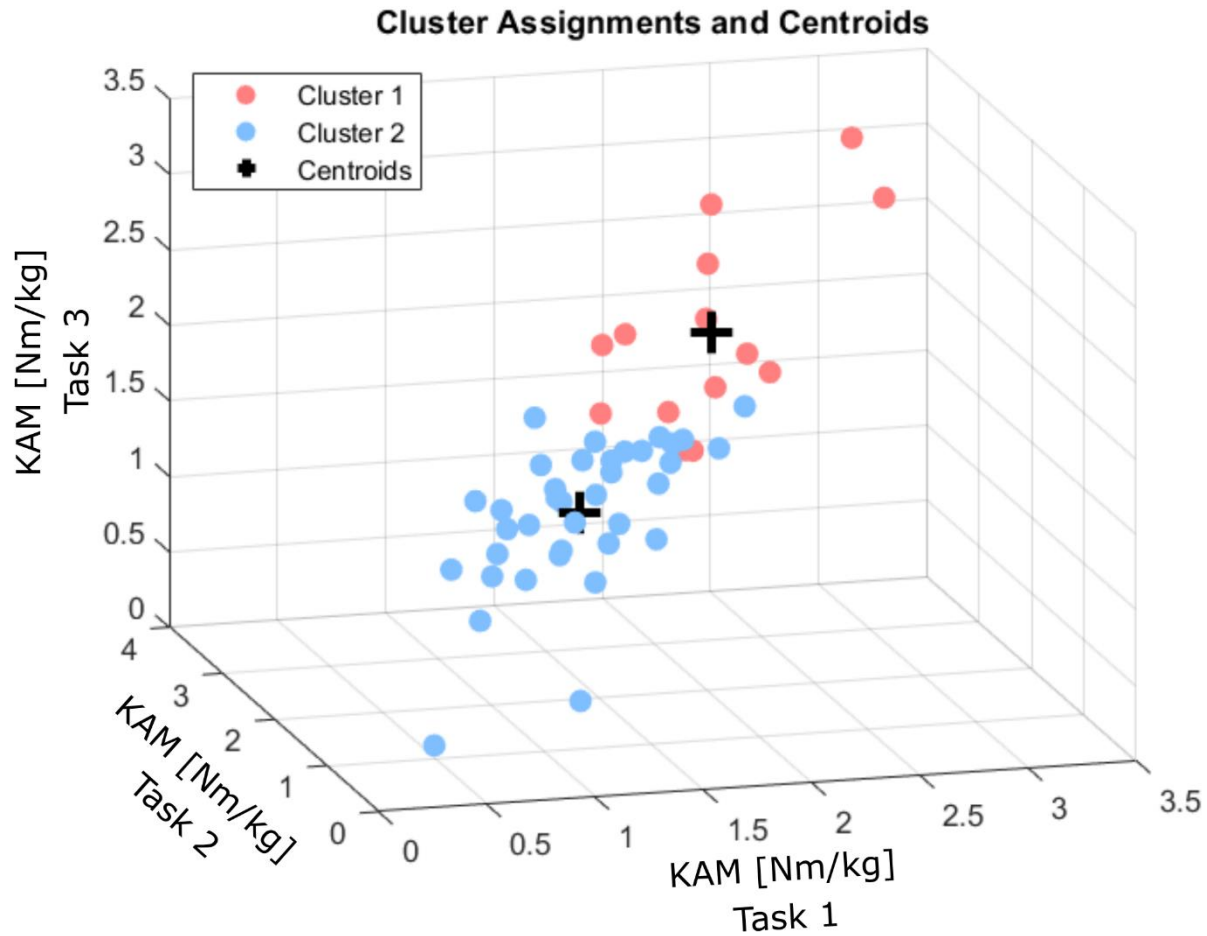
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## Appendix 1. League affiliation of athletes.

League	Cluster 1		Cluster 2		Total	
	<i>n</i>	Relative Share [%]	<i>n</i>	Relative Share [%]	<i>n</i>	Relative Share [%]
REMA 1000-ligaen*	2	14.3	4	10.8	6	11.8
First Division	2	14.3	5	13.5	7	13.7
Second Division	6	42.9	15	40.5	21	41.2
Third Division	2	14.3	5	13.5	7	13.7
Junior	1	7.1	7	18.9	8	15.7
Other	1	7.1	1	2.7	2	3.9

**Appendix 2.** Field positions of athletes. Numbers do not add up to 14 (Cluster 1), 37 (Cluster 2) and 51 (total) due to athletes playing multiple positions.

Position	Cluster 1		Cluster 2		Total	
	<i>n</i>	Relative Share [%]	<i>n</i>	Relative Share [%]	<i>n</i>	Relative Share [%]
Back	10	71.4	31	83.8	41	80.4
Line	2	14.3	2	3.9	4	7.8
Wing	3	21.4	11	29.7	14	27.4



**Appendix 3.** Cluster assignments and centroids based on the average peak external knee abduction moments within the first 100 ms of stance. Each data point represents one subject.

**Appendix 4.** Number of athletes with previous ACL injuries.

Previous ACL Injury	Cluster 1		Cluster 2		Total	
	<i>n</i>	Relative Share [%]	<i>n</i>	Relative Share [%]	<i>n</i>	Relative Share [%]
Cutting Leg	0	0	1	2.7	1	2.0
Non-Cutting Leg	1	7.1	4	10.8	5	9.8
Both Legs	0	0	1	2.7	1	2.0

**Appendix 5.** Technique variables and their magnitudes for all three tasks, results of repeated-measures ANOVAs and pairwise comparisons.

Variable	Task 1	Task 2	Task 3	Task Effect Pairwise Comparison			
				$P_{task}$	Task 1 vs. 2	Task 1 vs. 3	Task 2 vs. 3
Peak KAM (First 100 ms of Stance) [Nm/kg]	1.52 ± 0.54	1.73 ± 0.61	1.64 ± 0.56	<b>&lt;.001</b>	<b>.003</b>	<b>.022</b>	.37
Foot Strike Angle at IC [°]	3.2 ± 12.5	-2.1 ± 13.5	6.8 ± 9.9	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>.010</b>	<b>&lt;.001</b>
Foot Progression Angle at IC [°]	-8.2 ± 4.2	-9.5 ± 5.2	-10.7 ± 4.6	<b>.002</b>	.27	<b>&lt;.001</b>	.16
Knee Flexion Angle at IC [°]	24.6 ± 6.3	22.9 ± 5.1	24.3 ± 7.7	<b>.016</b>	<b>.023</b>	1	.06
Knee Valgus Angle [°] at IC	6.3 ± 3.8	5.8 ± 3.4	6.5 ± 3.6	.11	–	–	–
Hip Abduction Angle at IC [°]	17.4 ± 4.2	17.9 ± 4.9	18.8 ± 4.7	<b>.006</b>	0.41	<b>.017</b>	.166
Hip Rotation Angle at IC [°]	-1.9 ± 5.2	-1.7 ± 5.0	-1.6 ± 4.6	.72	–	–	–
Trunk Lateral Flexion Angle at IC [°]	8.1 ± 6.2	6.4 ± 6.7	7.8 ± 6.4	<b>.028</b>	.06	1	.06
Trunk Rotation Angle at IC [°]	-18.2 ± 10.4	-22.2 ± 11.7	-20.6 ± 10.5	<b>.014</b>	<b>.019</b>	.33	.69
Trunk Rotation Velocity at IC [°/s]	-70.7 ± 93.0	-105.7 ± 111.7	-85.7 ± 98.8	<b>.008</b>	<b>.034</b>	.46	.10
Horizontal CoM Velocity at IC [m/s]	2.91 ± 0.35	3.15 ± 0.34	2.96 ± 0.35	<b>&lt;.001</b>	<b>&lt;.001</b>	.64	<b>&lt;.001</b>
Resultant CoM Velocity at IC [m/s]	3.34 ± 0.29	3.52 ± 0.31	3.34 ± 0.31	<b>&lt;.001</b>	<b>&lt;.001</b>	1	<b>&lt;.001</b>
Anterior CoM Velocity [m/s]	2.70 ± 0.35	2.94 ± 0.35	2.78 ± 0.34	<b>&lt;.001</b>	<b>&lt;.001</b>	.19	<b>&lt;.001</b>
Lateral CoM Velocity [m/s]	1.05 ± 0.30	1.08 ± 0.32	0.98 ± 0.28	<b>.046</b>	1	.46	.07
Vertical CoM Velocity [m/s]	1.59 ± 0.34	1.54 ± 0.28	1.51 ± 0.32	<b>.025</b>	.32	<b>.046</b>	.71
Vertical GRF at Peak KAM [N/kg]	27.59 ± 5.73	28.51 ± 5.71	27.00 ± 6.53	<b>.038</b>	.41	.87	<b>.034</b>
Cut Angle [°]	70.8 ± 14.0	69.2 ± 14.9	61.5 ± 14.0	<b>.002</b>	.78	<b>&lt;.001</b>	<b>&lt;.001</b>
Cut Width at IC [°]	21.1 ± 2.5	21.5 ± 2.8	22.8 ± 3.1	<b>&lt;.001</b>	.75	<b>&lt;.001</b>	<b>.008</b>
Contact Time [s]	0.30 ± 0.05	0.31 ± 0.05	0.29 ± 0.04	<b>.002</b>	.32	<b>.008</b>	<b>&lt;.001</b>