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A methodology to support elbow flesh deformation for ergonomics modelling. Appendices

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APPENDIX A: Questionnaire for user study

Questionnaire on digital human usage for ergonomics CAD modelling

The use of digital human is a key component of ergonomics modelling. Several case studies reported the successful use of various digital human models to improve the physical ergonomics of different designs. Currently, the existing digital humans in various ergonomics applications are varied in terms of their realism, accuracy etc.

This questionnaire is part of a PhD study which aims to investigate the usage of digital human models in ergonomics CAD software. Any information that will be given will be treated as strictly confidential and will only be used for the purpose of this research.

Age _____ :

Occupation _____ :

Sex : Female [] Male []

PART I : EXPERIENCE RELATED TO ERGONOMICS CAD SOFTWARE USAGE

1. What types of CAD ergonomics software e.g. SammieCAD, Jack, Ramsis, Anthropos, MannequinPro etc, have you ever used?

Software name	Version (if applicable)	Duration of usage

2. What types of analysis/activity (e.g. postural analysis, fit and reach assessment) have you used the CAD ergonomics software for within the last 3-5 years?

Software name	Type of analysis

PART II : PERCEPTION OF THE IMPORTANCE OF DIFFERENT CRITERIA RELATED TO DIGITAL HUMAN MODEL

Please rate the importance of the following criteria for digital human model (DHM) in ergonomics modelling by *placing a cross [X] in the appropriate box*. The description for each criteria is also given for further clarification. You are also allowed to add your own criteria at the end.

DHM's appearance				
No	Criteria	Description		Relevancy to previous experiences
1.	Natural and realistic looking postures/motion	How important is the visual accuracy of the postures and motions that the DHM adopts (e.g. reach).	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
2.	Realistic appearance	How important is a visually realistic flesh form for the DHM.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
3	Level of details of realistic appearance	How important are realistic body details for the DHM (e.g. head, hands, feet, legs/arm, torso).	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
4.	Realistic and accurate joint flesh deformation	How important is visually realistic flesh deformation at the joint when the DHM	<input type="checkbox"/> Essential <input type="checkbox"/> Important	Have you used or would like to have used this function in any of your

		posture changes.	<input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
5.	DHM's flesh interaction with external forces	How important is the ability of the DHM's flesh to react to external loads e.g. flesh deformation of the buttocks/thigh in a sitting posture.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
DHM's size and shape				
No	Criteria	Description		
6.	Shape flexibility	How important is the provision of data to be able to transform the DHM to represent any possible human body shape.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
7.	Size flexibility	How important is the provision of data to be able to transform the DHM to represent any possible human size.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
DHM's function				
No	Criteria	Description		

8.	Postural/biomechanical analysis	How important is postural/biomechanical analysis to assess whether a particular design may result in injury related to musculoskeletal disorders.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	<p>Have you used or would like to have used this function in any of your ergonomics analysis?</p> <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
7.	Reach and fit analysis	How important is the ability to simulate whether a DHM fits i.e. adequate clearance, in a virtual environment set and is able to reach any specified object.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	<p>Have you used or would like to have used this function in any of your ergonomics analysis?</p> <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
10.	Hand grip and strength	How important is the analysis on the fitness of hand tools in terms of comfort, efficiency and required strength of use.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	<p>Have you used or would like to have used this function in any of your ergonomics analysis?</p> <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
11.	Visual sight line	How important is the ability to show the DHM's field of vision.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	<p>Have you used or would like to have used this function in any of your ergonomics analysis?</p> <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
12	Field of view on a mirror	How important is the ability to show the DHM's field of vision on a mirror.	<input type="checkbox"/> Essential	<p>Have you used or would like to have used this function in any of your</p>

			<input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
Miscellaneous				
No	Criteria	Description		
13.	Adding variety of clothing, helmets, etc.	How important is the ability to add clothing and accessories to assess their fitness and effects on motion restriction.	<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
14.	Other criteria:		<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither
15.	Other criteria:		<input type="checkbox"/> Essential <input type="checkbox"/> Important <input type="checkbox"/> Desirable <input type="checkbox"/> Unimportant	Have you used or would like to have used this function in any of your ergonomics analysis? <input type="checkbox"/> Used <input type="checkbox"/> Like to have used <input type="checkbox"/> Neither

PART III : PERCEPTION OF THE REQUIRED LEVEL OF DETAIL FOR A REALISTIC LOOKING DIGITAL HUMAN MODEL

For part III and IV, the term “realistic looking” does not include flesh deformation due to physical contact with objects e.g. buttock deformation while sitting.

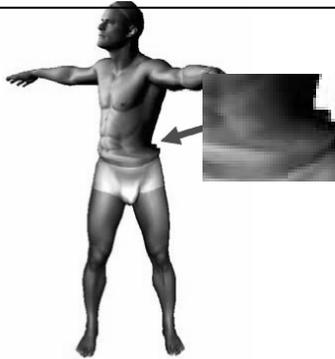
1. For each statement, please placing a *cross [X]* in one of the boxes.



a) A realistic looking DHM should be represented by enhancing the details of the whole body (i.e. accuracy must be uniform).
 Strongly agree Agree Neutral Disagree Strongly Disagree



b) A realistic looking DHM should be represented by enhancing the details for certain body parts only e.g. hand, feet, head/face and torso (i.e. accuracy is not uniform).
 Strongly agree Agree Neutral Disagree Strongly Disagree



c) Unrealistic joint flesh deformation affects the overall level of DHM's realism.
 Strongly agree Agree Neutral Disagree Strongly Disagree

2. Bearing in mind the “realistic looking” definition above, what other aspects should be considered to create a realistic looking DHM?

3. The more accurate and realistic a digital human model (whole body), the more likely it will take time to render/manipulate it. For ergonomics modelling applications, do you think that a waiting time would be inconvenient for you in the situation in which a real time interaction is required (e.g. manipulating the posture) ?
- YES NO POSSIBLY

Please explain.

4. If your answer is YES to question 3, i.e. waiting time is inconvenient for you, would you be willing to compromise by having a less accurate but still a realistic looking digital human model?
- YES NO POSSIBLY

Please explain.

5. If your answer is NO or POSSIBLY to question 3 i.e. a waiting time is convenient for you, is waiting time dependent on the type of activity?
- YES NO POSSIBLY

Please explain.

PART IV : PERCEPTION OF THE IMPACT OF A REALISTIC LOOKING DIGITAL HUMAN MODEL

1. Do you think that more realistic looking DHMs will be part of the future trends of DHM's characteristics in ergonomics CAD software?
- YES NO POSSIBLY

Please explain.

2. Do you think that a realistic looking DHM would improve the accuracy of ergonomics analyses, e.g. reach and fit analysis?

YES NO POSSIBLY

Please explain.

3. Do you think that a realistic looking DHM would be useful for aesthetic purposes e.g. presentations and visualisations to clients?

YES NO POSSIBLY

Please explain.

4. Disregarding all other issues such as pricing, ease of use, etc., would a realistic looking DHM affect your choice of ergonomics CAD software?

YES NO POSSIBLY

Please explain.

PART V : PERCEPTION OF THE IMPORTANCE OF FLESH DEFORMATION DUE TO CONTACT WITH EXTERNAL OBJECTS/LOADS

1. Do you think that flesh deformation due to contact with external objects e.g. flesh deformation on the buttocks in a sitting posture, will be part of the future trends of DHM's characteristics in ergonomics CAD software?

YES NO POSSIBLY

Please explain.

2. Do you think that flesh deformation due to external forces or contact with other objects will improve the accuracy for ergonomics analysis, e.g. reach and fit analysis?

YES NO

Please explain.

3. If your answer is YES to question 2, do you think that the flesh deformation should be accompanied by object deformation as well?

YES NO

Please explain.

4. Is it important that the flesh deformation, due to contact with external objects, should be implemented for the whole body?

YES NO

If your answer is YES, please explain.

If your answer is NO, which parts of the body are most important?

PART VI : PERCEPTION OF THE CHARACTERISTICS THAT DEFINE THE OVERALL QUALITY OF ERGONOMICS CAD SOFTWARE

If you have used more than one CAD ergonomics software package, what characteristics affect your judgement about the overall quality of ergonomics CAD software?

Thank you for your time!!

Your responses are very important to this research.

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*APPENDIX B: Result of digital cross sections
parameterisation for participants for the review of the new
FDM*

UAF											
A full extension	39.5797	49.50011	55.63955	55.7712	52.9025	135 flexion	39.8847	48.35183	56.4402	58.0455	51.6633
	44.6262	50.22956	55.2385	60.5575	55.4484		44.3919	51.80329	58.4907	61.7575	54.1502
	46.6677	46.89639	50.25542	60.1201	52.1914		45.9091	50.53342	53.2543	59.5702	51.5833
	46.5392	44.51125	44.20867	55.9715	45.3997		45.6727	46.26564	46.2648	56.0891	46.8110
	46.3397	43.13367	40.67106	52.9074	41.1117		45.9204	44.12934	42.1713	52.0117	42.8745
	47.2889	40.85708	38.66513	52.3780	39.7785		48.6021	42.13665	40.8810	48.3463	40.4765
	45.7826	38.30655	38.96874	50.0756	37.5636		49.4395	40.14512	41.5333	44.8701	38.0349
	44.2649	34.29286	41.07453	43.0896	35.0374		45.3967	38.05554	40.7023	42.1463	36.2945
	38.5698	29.62025	40.75947	35.8670	33.5366		39.9482	32.62017	37.8333	39.8958	34.6439
	32.0981	26.92066	36.92553	31.2383	32.1052		34.4483	27.14536	34.9434	34.9006	32.0152
	27.1242	25.96687	33.46113	28.9974	31.3013		29.8826	24.37304	34.3135	31.4251	29.5765
	25.0526	25.19397	32.9178	28.6601	31.5249		26.9659	22.83309	33.7943	30.1349	29.1587
	25.1929	25.49316	34.35537	30.0741	32.8509		25.9471	23.39224	33.3965	30.9835	30.8639
	26.541	27.80626	38.45255	33.4207	36.0984		26.7711	26.10309	35.9974	34.1586	34.3727
	29.2484	34.39055	45.08487	39.0618	41.8829		29.5967	32.62267	41.5906	40.0902	38.5709
33.7486	44.15087	51.29435	47.3858	48.0815	34.4454	41.70865	49.6705	48.7376	45.7788		
90 flexion	40.3234	44.54719	57.09024	58.81077	53.0975	A full flexion	38.6662	32.2798	47.17094	55.41804	49.5087
	43.1643	48.08719	57.01914	63.33062	55.3986		42.0331	37.29796	48.44335	56.65598	49.3911
	44.1408	48.40798	51.37689	62.74062	52.9104		45.9294	40.21561	49.03443	58.45573	49.3327
	45.3079	47.02629	45.10781	56.61641	47.5605		48.5247	43.26008	48.81065	59.0384	47.6303
	47.8791	45.25003	40.64052	51.89744	42.3184		50.0971	47.14877	48.85565	58.03302	45.525
	51.0597	44.61685	37.69253	50.23911	39.4312		51.4433	52.05694	49.86686	57.53512	44.5936
	52.9219	45.00805	36.19334	49.77332	37.9641		54.0783	55.15368	51.51265	55.04054	44.3761
	49.5242	43.91766	36.04787	45.84011	36.3826		52.8063	53.69099	51.92189	51.4038	44.9387
	42.8243	40.23202	36.78353	38.77866	35.1936		46.6779	49.1296	49.94534	45.73246	45.3757
	37.2003	33.303	36.55158	32.84993	32.941		40.2503	41.65164	47.59975	38.92782	44.3109
	32.4837	26.77789	35.62189	28.45182	30.2713		35.3684	32.83626	45.11135	35.54139	43.3987
	29.7381	23.36616	34.91949	26.49121	29.4556		32.4651	27.11911	43.98028	34.69707	43.3527
	28.9119	22.41243	36.07012	26.98758	30.7999		31.5188	24.34787	42.99985	36.29214	44.3967
	29.697	23.66625	40.28752	30.09841	34.5486		32.2217	23.70138	42.69365	40.49474	46.3462
	31.9835	27.71388	47.27213	36.54387	40.8006		33.8148	24.83397	43.54636	46.80782	48.5269
35.7864	35.93973	53.73463	47.07533	47.5325	35.9746	27.69724	45.45724	53.37694	49.8613		

UAM											
A full extension	42.8169	50.3282	55.42372	57.7972	49.8905	135 flexion	41.2165	41.20849	53.2882	48.6550	51.3131
	44.968	53.72784	52.81383	60.3678	48.0077		43.2641	42.8872	53.6267	52.3692	49.0286
	45.453	51.36893	48.25585	59.3532	45.5551		43.1695	44.7128	49.8342	54.7607	45.4517
	44.5849	44.45781	42.80729	53.3295	40.3223		42.1371	44.66669	42.6040	52.5926	41.9733
	41.4857	36.01601	36.6032	45.5023	34.1862		42.3967	42.12227	37.4407	45.9600	40.1218
	37.571	29.79409	32.19381	38.6260	29.9085		42.2563	42.3021	35.4217	39.2863	38.6449
	33.6769	26.00494	29.97234	32.7984	28.0255		40.4366	41.09956	34.5947	32.6905	36.4581
	30.5187	23.15314	29.08795	28.7735	27.6397		37.9142	35.24147	34.3519	25.9083	34.2273
	27.9355	21.65307	28.93611	26.7790	27.1631		33.497	30.64858	33.9076	23.5701	33.3998
	25.7957	22.31978	29.03543	25.8889	27.1435		29.8802	27.19515	32.3673	23.9892	34.3606
	24.5428	24.63192	30.34323	26.5810	28.6759		27.683	25.22473	31.9607	26.4566	35.0802
	24.714	28.38691	32.9454	28.8813	31.8556		26.6372	24.77034	31.7455	30.5884	35.2718
	26.6147	31.57041	37.38759	32.2568	36.1685		26.7405	25.57289	32.8855	36.0533	36.0541
	30.0872	34.83667	44.13772	37.8429	41.0021		28.3698	28.18612	35.7377	40.9519	39.5168
	34.2477	40.92786	49.53604	45.7638	46.2167		31.7279	32.3105	41.1192	44.8174	45.1298
38.4174	46.86116	53.61041	53.0884	49.3197	36.7244	37.09735	49.7223	46.8922	50.1943		
90 flexion	36.3557	40.57915	50.53942	56.1682	52.711	A full flexion	20.9456	20.98079	37.35518	33.67977	49.5087
	40.2897	43.78543	50.54217	60.56608	52.199		23.6636	23.27297	37.90139	38.16875	49.3911
	42.565	44.2395	46.53439	59.06781	48.5559		31.8823	29.12179	39.56828	46.64934	49.3327
	43.7447	43.76241	41.66615	54.26493	43.4416		44.6221	37.20376	42.66584	54.34785	47.6303
	44.6162	43.41861	38.96045	50.24637	39.2521		48.9853	44.55459	46.42508	57.79632	45.525
	45.8595	43.40786	37.90805	45.7104	35.4641		50.8187	49.19	49.79649	57.7725	44.5936
	47.4814	43.32973	37.49033	42.05339	33.0136		51.0061	53.58661	50.89794	54.40653	44.3761
	46.1616	41.3324	37.07189	37.60156	33.2423		49.6788	52.55627	49.29626	47.38868	44.9387
	40.8739	37.91087	36.57915	31.93007	33.4824		44.8083	46.55015	49.16541	42.89037	45.3757
	34.838	30.80345	35.56984	27.25276	33.3598		38.8781	38.21427	51.41606	40.60881	44.3109
	29.7986	26.58325	35.00777	24.91191	33.5973		34.9253	31.88124	50.59073	39.70996	43.3987
	26.4329	24.57319	35.55926	24.82987	33.6105		32.9817	28.0124	49.28494	39.38698	43.3527
	24.8709	24.28733	37.55692	27.10147	34.7125		31.1153	25.97805	45.80261	39.10954	44.3967
	25.046	25.65296	41.14846	31.64531	38.1218		28.389	24.19064	42.20334	38.44241	46.3462
	26.991	29.12212	45.77232	38.29476	43.8929		24.3026	22.56962	39.41467	36.71698	48.5269
30.9899	34.85184	49.35749	48.37729	49.9098	21.2748	21.09798	37.78098	33.78202	49.8613		

E											
A full extension	28.30287	33.26593	34.57603	35.0820	33.16234	135 flexion	31.38215	35.57871	37.9257	39.8465	35.4252
	30.25548	35.79496	36.3549	36.4554	34.33664		32.85049	34.93032	39.2430	40.3044	35.4725
	34.71619	40.33049	40.71183	40.0437	37.57507		35.63748	35.93622	42.7293	41.0012	35.8986
	38.14259	43.64458	44.60605	43.6989	40.54987		37.08604	38.51247	44.0239	40.7578	37.0514
	37.50193	43.3176	44.66952	46.2854	41.75948		37.97895	39.74001	42.6452	41.0246	38.1405
	34.18297	40.30057	41.32464	46.9156	40.92705		37.22117	38.8368	40.6092	41.7039	38.2570
	29.45078	36.962	37.56999	42.0832	36.78893		35.4629	40.27708	39.3520	42.8618	37.6350
	29.32758	35.40209	36.57085	37.3859	33.72789		33.76265	38.5624	40.0320	43.1309	37.3271
	27.47342	31.29842	33.13645	33.2548	33.40779		28.68805	29.82908	37.9202	35.7400	33.5847
	23.18327	26.67513	26.1183	28.0796	33.73637		23.38591	27.21051	33.3152	33.3068	27.5062
	19.92921	24.71358	22.93907	26.9401	32.17028		22.74046	28.67399	30.6663	35.6538	25.0014
	22.6214	30.38309	29.62193	32.5355	32.7603		29.38427	33.26397	32.4366	38.8994	29.6711
	33.83145	42.21428	44.30104	46.5077	40.79611		37.59852	38.70316	39.3514	40.7492	37.6029
	40.23437	43.54708	43.83024	47.1361	44.0978		38.86933	41.01576	46.4801	42.8759	40.8426
	37.03879	38.48096	39.76903	42.3284	41.24642		36.50622	40.95581	48.4802	43.2739	39.3343
30.44848	33.61837	35.82657	37.0866	35.89015	32.67742	37.75886	41.9464	41.2793	36.1707		
90 flexion	38.24129	43.27918	46.94079	47.05771	46.63623	A full flexion	44.21448	52.54985	56.9689	49.0584	47.39202
	36.82584	38.14609	44.81418	44.02187	42.68492		41.38571	48.417	57.06679	48.9468	46.45007
	35.96863	35.55725	42.83968	41.52629	38.93375		39.52088	45.63997	54.05186	49.4957	45.53891
	35.55748	35.8368	40.80592	39.95341	37.26419		38.93205	44.57091	49.1168	50.0762	43.47263
	35.65484	38.80323	39.20769	40.76225	37.67457		37.51494	44.34585	44.31605	49.9552	39.76275
	35.93935	42.21454	39.10788	41.63639	39.84032		36.03489	47.21946	41.83279	49.5121	39.44397
	35.48453	44.84634	41.34345	42.21324	42.53285		39.4841	53.60559	44.46276	51.0116	43.21564
	37.90569	46.15706	45.37939	45.63115	45.61381		45.74994	56.46702	52.93973	52.6536	48.79686
	38.21719	42.31307	45.972	47.39716	46.21797		43.24876	51.38319	56.03005	46.8692	45.77362
	33.04465	35.10925	36.92627	41.39142	39.7261		37.82973	46.29518	53.06744	42.1055	41.63269
	30.69971	32.85078	33.42628	36.43003	36.31792		31.81004	37.77112	43.64956	36.0339	36.72385
	32.12521	34.4904	33.64948	35.89567	35.8071		30.14578	36.45185	39.75875	37.5426	33.82656
	34.89862	38.81669	37.10503	39.14787	37.54396		34.226	40.51993	43.9097	49.6449	38.57794
	37.73433	42.95999	43.04888	45.14057	40.88482		41.09882	48.16106	48.34276	52.5725	44.42135
	39.75017	46.68167	47.82549	49.55563	44.43531		45.65268	54.85514	52.06762	51.7652	47.674
39.71261	47.03045	48.6805	49.64009	46.6765	46.55299	55.56077	54.82895	50.1556	47.73884		

LAM											
A full extension	41.0946	41.57594	49.94349	54.5174	40.7759	135 flexion	37.0547	39.92015	49.0003	48.7319	40.6490
	41.3809	44.03856	49.84536	53.2305	39.141		37.3318	42.68317	49.0760	52.4757	38.0564
	41.2556	47.2462	48.30856	52.9111	38.0467		37.3448	47.11895	46.7979	54.7638	35.6940
	38.5028	46.11102	41.85145	49.9510	35.2037		35.659	49.85619	41.3420	52.4641	33.8128
	32.1732	41.04333	32.03689	44.4534	31.0455		32.8076	45.21056	35.6187	45.7522	31.1681
	23.1101	33.95005	24.09362	37.8752	26.7227		28.722	39.61741	31.5723	39.1486	28.0303
	17.7236	28.72481	19.10901	31.4843	23.6068		24.2847	34.99776	28.5989	32.4615	25.2634
	15.1595	23.08488	17.28066	25.4220	22.0213		21.567	29.85448	25.7119	25.7971	23.3306
	14.5617	19.03436	17.22004	22.4879	22.0477		20.7539	25.85015	23.3392	23.5502	22.5803
	15.5938	18.20282	17.98338	22.3610	24.4218		22.022	24.94911	23.1394	24.0306	23.7052
	18.5098	20.93245	20.44729	24.7307	29.1047		26.0671	26.60887	25.7666	26.5455	27.0873
	24.117	29.43894	28.1037	29.6286	36.5006		32.4965	32.40764	31.5961	30.7211	33.3217
	32.2739	40.92829	39.93293	36.8234	44.9046		37.0871	36.89347	39.7900	36.2023	41.8182
	38.2644	46.37572	51.42253	44.8443	49.3755		38.7708	39.20189	47.3398	41.0654	46.2312
	41.0792	44.50255	56.29419	51.6283	47.4771		38.2808	39.56045	51.3247	44.9044	46.5073
41.3207	41.82602	52.73411	55.7042	43.7549	37.3011	38.76333	50.0589	46.9249	43.3564		
90 flexion	35.5669	41.57743	51.37178	45.73355	41.9943	A full flexion	29.7472	35.75743	35.80422	36.02981	36.4303
	35.4121	43.93573	50.48232	47.26528	40.2636		33.5462	36.45837	36.30794	38.18965	36.5435
	36.8934	45.88974	47.60997	50.10014	37.1679		36.7002	40.49292	39.26254	41.82857	36.7906
	37.7186	47.25419	43.80692	53.88623	33.4022		38.9285	46.25967	43.35889	46.15115	37.9479
	36.2301	46.08561	40.48709	55.63068	29.5875		39.4747	49.23031	45.76266	49.93883	39.1427
	32.1688	41.29426	37.00918	53.91597	26.3672		35.7669	50.13936	45.65588	49.60321	35.8773
	26.6727	36.49208	32.24669	42.2222	24.4161		28.2453	41.03854	40.92308	43.46919	31.6629
	23.4295	32.02424	27.58819	32.3901	24.34		22.4842	33.13673	35.61347	38.31001	27.7474
	22.4541	27.268	25.13398	27.4362	25.4815		20.6355	30.13512	34.40166	37.76835	26.3945
	23.4085	24.72953	25.38289	25.7971	27.7684		21.6609	31.96032	36.65703	40.03768	28.5218
	26.0414	25.92848	27.85719	26.55114	31.2966		24.9727	34.23761	40.28178	44.53257	35.8779
	29.7183	30.12418	32.90771	29.5268	36.1276		29.5216	35.54779	44.75117	47.55305	42.2508
	33.3667	33.88051	40.04813	34.47071	41.0576		32.5582	37.77879	48.3515	47.97651	42.2227
	36.0663	36.91468	45.60669	38.98893	43.2447		32.0536	39.17301	48.808	42.1674	40.2974
	37.0887	39.44943	48.42936	42.29089	43.7648		29.8148	37.36748	42.32964	36.585	37.9499
36.572	40.63765	50.65621	44.69844	43.0683	28.6169	36.22987	37.16915	35.26908	36.6871		

LAF											
A full extension	33.5462	40.1356	43.74902	48.3488	29.8855	135 flexion	30.7445	35.28694	40.1518	40.9004	32.6331
	34.9228	41.4351	42.71927	49.2332	27.0465		31.8346	36.4613	41.4718	44.6762	33.2334
	36.6706	42.66523	42.63137	48.6665	24.7798		33.3446	39.39208	41.9606	48.9175	34.4651
	36.9026	42.78304	40.86658	46.6997	23.8541		34.4518	42.65265	40.5136	50.8386	35.5551
	33.4843	39.0465	36.25442	43.4316	25.2071		32.6959	44.04419	37.7616	49.7336	34.9534
	28.319	33.35962	29.8548	40.3160	27.543		29.2844	41.71914	34.6930	45.6869	30.8835
	22.9382	29.55489	25.2448	36.0704	28.9071		25.8083	35.84897	32.0778	37.8972	26.6624
	18.3686	26.5655	22.35902	30.1949	28.5904		21.434	31.70101	28.0859	31.7543	23.6216
	17.2519	25.37128	21.83567	27.5901	28.4469		20.1032	29.91596	26.1625	28.8990	22.3284
	18.2532	24.48958	23.82546	27.9202	31.1664		21.5551	29.7375	27.0454	28.2223	23.3432
	20.8299	25.99882	28.13758	30.3977	35.3084		24.891	31.4082	29.5133	29.0545	26.0008
	24.5508	30.84476	33.0141	33.8940	38.1538		27.8968	33.27836	32.4017	31.1965	28.8520
	27.9398	36.55178	39.79595	38.7030	39.3116		30.1329	34.19706	34.8832	33.5751	30.5223
	30.6751	40.08408	45.42902	41.6004	39.2304		30.9849	34.92975	37.8327	35.1203	31.2337
	32.2117	40.08595	45.77182	45.6695	36.7255		30.2791	35.86801	38.4576	36.7297	31.8960
32.8527	39.4891	44.56388	47.3072	33.2691	30.145	35.84172	38.9945	38.4690	32.2211		
90 flexion	27.9794	35.74052	38.59318	37.43596	32.8125	A full flexion	26.6149	33.20618	31.42683	33.38957	35.6966
	28.5211	37.23758	38.93456	41.62376	32.9001		30.1781	34.71812	31.74573	33.67085	35.9443
	30.2973	39.94966	39.14143	46.43186	32.9446		33.3977	37.62337	33.78208	35.60556	35.6862
	31.3817	42.8967	39.74571	51.6523	32.2291		35.2123	40.94111	36.81762	39.4487	34.8994
	31.1861	44.53086	40.09657	54.72146	30.2537		35.2356	44.94662	40.035	42.63699	34.3295
	29.5641	43.05326	38.32195	51.87007	27.2732		33.3155	45.74173	42.87158	42.97034	33.624
	26.2366	38.42249	33.62922	43.95153	24.5193		26.8681	40.81568	39.93903	40.2472	31.2451
	23.0884	33.25664	29.52951	34.90963	23.0866		21.8622	33.07867	34.93804	36.30102	28.3536
	21.6921	29.15326	28.62556	31.05982	23.0941		19.8715	30.74269	33.61614	35.45952	26.831
	22.7079	25.42337	30.02135	28.66141	24.6489		20.2698	31.78924	36.17427	37.87349	29.0053
	25.1811	24.1994	32.89385	27.37057	27.8242		23.1924	32.0718	39.49376	40.62832	33.2025
	27.7831	24.67726	35.51099	27.53232	32.2619		26.2697	33.46222	42.2696	41.9213	36.9208
	29.7831	26.1641	36.35402	28.55655	33.7556		27.6215	33.19866	43.23632	41.85896	38.6482
	30.4679	29.09911	35.92523	30.13075	33.4116		27.073	33.56655	40.06256	40.63227	37.918
	29.8129	32.99582	35.95269	31.68581	32.827		25.5983	33.43827	35.9836	37.16247	35.8947
28.6492	34.82504	37.25042	33.95098	32.6425	25.2168	33.10299	32.85089	34.42105	35.1727		

APPENDIX C: Distances between points along profiles and bones for the participants for the review of the new FDM

	(mm)			
	Full extension	135°	90°	Maximum flexion
Participant 1	41.3508	42.7562	45.6706	48.3861
	36.3665	39.8202	44.0215	47.6969
	34.0656	38.4611	43.2618	47.3259
	30.3415	36.181	42.0219	46.6715
	23.3626	28.8322	34.8878	38.975
	21.9174	27.2649	33.1402	36.794
	20.2941	25.7042	31.1591	34.3621
	15.8753	22.4369	26.1574	28.4375
	12.6816	19.4375	21.3125	20.4025
	12.5028	18.7901	20.2956	17.7345
	12.3365	18.2698	19.7462	16.1019
	12.1817	17.8391	19.5204	15.4062
	12.0475	17.5024	19.3828	15.4682
	11.9279	17.2818	19.1056	16.1816
	11.8178	17.138	18.753	17.4136
	11.7168	17.0985	18.5139	18.8579
	11.634	17.1694	18.5795	20.2558
	10.8753	17.8593	19.9339	21.779
	10.7782	18.0419	20.4601	21.5041
	11.0159	18.098	20.7708	21.9637
	11.9958	18.3348	21.2173	23.8414
	12.5151	18.5512	21.4437	24.4663
	14.0124	19.5805	22.4911	24.7461
	15.2742	20.2477	22.4698	24.5451
	16.2466	20.4727	22.2663	24.4271
17.3844	20.4126	21.6077	24.1718	
Participant 2	29.5789	39.2628	46.0484	51.7267
	24.2744	34.9937	44.2118	50.9076
	22.2917	33.0784	43.3228	50.5217
	19.745	30.0365	41.8577	49.9175
	17.1798	22.7709	33.2607	40.8437
	16.8098	21.449	31.2586	38.896
	16.3972	20.2147	29.1826	37.0486
	15.4116	18.0734	24.8267	33.4436
	15.2023	17.1188	21.7864	29.5583
	15.2176	17.0805	21.5704	28.7513
	15.2392	17.1087	21.9104	28.3375
	15.2671	17.2147	22.7903	28.3862
	15.3015	17.4088	24.1353	28.9766
	15.3497	17.6768	25.759	30.2873
	15.4067	18.0186	27.3351	32.2919
	15.4704	18.4362	28.769	33.6238
	15.5411	18.9489	30.0841	33.339
	16.9337	21.8075	32.3497	32.3449
	18.1859	23.0067	32.5374	33.415
	19.0855	23.471	32.3737	34.9011
19.9577	23.3326	32.135	37.9175	
20.0962	23.1382	32.4792	39.2743	
20.6259	22.969	33.9803	39.3054	

	(mm)			
	Full extension	135°	90°	Maximum flexion
	21.6897	23.9711	34.0736	38.6417
	22.3854	24.6584	34.0727	38.2904
	23.908	25.9629	33.9538	37.5625
Participant 3	41.3373	44.1249	45.9579	50.3159
	35.0512	41.1019	44.631	49.5843
	32.4779	39.7303	43.8893	49.1491
	28.3347	37.282	42.5944	48.35
	22.7195	27.5345	36.2336	40.081
	22.2029	25.5634	34.6958	38.0167
	21.0875	23.8867	32.7656	35.9148
	14.9598	21.8997	27.6601	30.5517
	13.9773	21.6721	23.6213	22.2591
	13.9902	21.7831	23.1539	20.1561
	14.0046	21.9429	23.0165	19.0858
	14.0203	22.1304	23.139	18.8187
	14.0376	22.3199	23.4455	19.2625
	14.0563	22.4819	23.821	20.4432
	14.0764	22.5564	24.0834	22.3396
	14.0981	22.5961	24.0346	24.6942
	14.1254	22.643	23.8128	26.1891
	15.2909	22.5794	23.33	26.5326
	15.683	21.8667	22.8667	26.2923
	14.9762	21.1781	22.6354	26.7393
	13.8357	21.0424	23.2199	30.0629
	14.1683	21.4314	23.9569	31.7215
	16.1791	23.3949	26.7789	33.7838
	18.5085	24.4462	27.5432	33.5494
	19.6286	24.8911	27.8401	33.3644
21.5056	25.7115	28.2541	32.8946	
Participant 4	41.0328	44.3335	45.1887	48.3813
	34.5872	41.0651	43.046	46.3441
	32.2756	39.5916	42.1348	45.3781
	29.497	37.248	40.6902	43.789
	25.1253	28.4956	31.4894	33.9401
	24.022	26.3168	28.9825	31.5857
	22.7178	24.1148	26.22	29.115
	18.1292	19.9674	19.8114	23.3983
	14.7893	16.894	15.162	16.7837
	14.5972	16.4379	14.5699	15.5157
	14.4284	16.0723	14.245	14.9988
	14.2732	15.7999	14.1862	15.1024
	14.1309	15.6145	14.3355	15.8572
	14.0111	15.5145	14.6876	17.3082
	13.9117	15.5006	15.2578	19.6129
	13.8232	15.5741	16.035	22.9768
	13.7452	15.7385	17.0291	27.2154
	13.342	16.8902	20.3746	32.0674
	13.8934	17.2877	20.9459	31.7012
	15.3891	17.6745	21.5453	31.5998
18.8532	19.1694	23.6139	34.5083	
19.8711	20.2914	24.9645	36.2488	
22.5102	23.8957	30.0336	37.831	

	(mm)			
	Full extension	135°	90°	Maximum flexion
	25.6806	25.5785	31.2255	37.1712
	27.1624	26.3856	31.5904	36.6933
	28.9528	27.7768	31.7764	35.456
Participant 5	39.3813	42.5854	45.5618	46.81
	34.6141	40.1714	44.5785	46.4383
	32.7791	39.1111	44.1081	46.2265
	30.4379	37.4562	43.3121	45.8077
	28.2235	31.5079	36.5907	39.6533
	27.7933	30.0453	34.5794	37.5623
	27.1796	28.5808	32.3195	35.0949
	24.8252	25.4329	27.1173	28.5677
	21.9588	22.8955	22.9769	21.9626
	21.5356	22.4296	22.2585	20.8377
	21.1446	22.0811	22.0153	20.5695
	20.7836	21.8415	22.1635	20.9483
	20.4547	21.6562	22.621	21.8986
	20.1574	21.5701	23.2125	23.3493
	19.8908	21.5457	23.7318	24.9203
	19.6646	21.6046	24.187	25.9597
	19.4587	21.731	24.6776	26.5853
	18.8455	22.4773	26.2033	27.3393
	19.5997	22.322	26.255	27.2062
	20.2229	21.9234	26.1239	27.5119
	20.2485	21.753	26.0859	29.0503
	20.3709	22.0237	26.2174	29.9465
	21.5448	23.9174	26.5866	31.9001
23.4278	25.0209	25.8342	31.6455	
24.1241	25.205	25.2393	31.3742	
24.1775	24.7967	23.6352	30.5489	

*APPENDIX D: Result of digital cross sections
parameterisation for participants for the review of the
framework*

UAF Asian Female													
A full extension	63.3552	52.9025	39.5797	40.3081	43.4182	44.8026	135 flexion	63.3866	51.6633	39.8847	43.5997	44.6406	45.2257
	58.7947	55.4484	44.6262	45.1886	42.4509	47.5678		60.1241	54.1502	44.3919	44.9607	43.6427	46.738
	54.2829	52.1914	46.6677	46.7294	39.6929	46.7221		55.0972	51.5833	45.9091	45.5599	40.4502	45.1965
	51.5648	45.3997	46.5392	46.9369	36.8504	44.0885		51.6292	46.8110	45.6727	46.5845	37.9066	43.2028
	51.3225	41.1117	46.3397	47.1937	36.3229	41.9886		51.1209	42.8745	45.9204	48.1182	37.2233	42.2228
	54.9464	39.7785	47.2889	49.3644	36.4212	39.8132		54.4292	40.4765	48.6021	48.382	38.3552	40.7499
	60.8689	37.5636	45.7826	50.7171	36.1349	38.3418		58.7668	38.0349	49.4395	48.3891	39.8336	39.8726
	59.0546	35.0374	44.2649	47.0454	36.5907	37.3203		61.6148	36.2945	45.3967	46.6175	39.1847	37.0509
	58.1587	33.5366	38.5698	42.7999	34.8169	32.5657		59.1829	34.6439	39.9482	40.2506	37.3787	33.056
	58.4123	32.1052	32.0981	37.2581	31.2799	28.2308		56.7038	32.0152	34.4483	33.0463	34.588	28.1555
	54.1963	31.3013	27.1242	30.791	29.8496	25.6004		56.0824	29.5765	29.8826	28.159	30.7105	26.1067
	49.1023	31.5249	25.0526	26.6735	29.9179	24.937		52.7816	29.1587	26.9659	25.5626	28.4975	25.1806
	48.3450	32.8509	25.1929	25.2927	31.1691	26.0156		51.1388	30.8639	25.9471	25.1952	28.7947	25.6321
	51.2219	36.0984	26.541	26.0991	33.622	28.5888		53.2597	34.3727	26.7711	27.0901	31.5572	28.2441
	56.0982	41.8829	29.2484	28.983	37.4062	32.9032		57.6279	38.5709	29.5967	31.5549	36.6008	33.6221
	61.3851	48.0815	33.7486	33.9207	41.2022	39.2996		62.1897	45.7788	34.4454	38.7348	42.1254	40.0055
90 flexion	58.5352	53.0975	40.3234	40.7224	42.1786	44.2594	A full flexion	59.6195	49.5087	38.6662	38.813	33.6774	43.0775
	58.2486	55.3986	43.1643	45.4513	42.0741	45.5246		57.7213	49.3911	42.0331	39.5784	34.2043	43.1446
	55.308	52.9104	44.1408	48.2694	39.7052	44.6783		56.0187	49.3327	45.9294	41.2684	35.9209	42.6125
	52.6423	47.5605	45.3079	49.2697	37.5132	43.1943		55.5842	47.6303	48.5247	43.755	38.2919	42.194
	52.719	42.3184	47.8791	50.4328	37.0592	43.2011		57.05	45.525	50.0971	45.4211	40.6495	43.6605
	57.8135	39.4312	51.0597	52.5279	37.9978	44.0237		60.7906	44.5936	51.4433	47.3569	42.905	43.7569
	64.7063	37.9641	52.9219	53.9059	40.2189	43.4556		66.1682	44.3761	54.0783	50.6578	46.5126	43.9974
	67.812	36.3826	49.5242	50.5666	41.238	42.6895		71.0447	44.9387	52.8063	53.779	47.7349	45.0129
	65.6673	35.1936	42.8243	44.6505	39.2932	37.8822		72.9457	45.3757	46.6779	51.1397	45.955	41.9252
	60.4358	32.941	37.2003	34.4651	36.2827	31.5269		71.482	44.3109	40.2503	45.8943	43.8551	37.1816
	54.3284	30.2713	32.4837	27.0252	33.6272	27.1643		67.5994	43.3987	35.3684	43.7909	41.964	33.7489
	49.6838	29.4556	29.7381	23.2795	31.6809	24.9003		63.4919	43.3527	32.4651	41.5802	38.3134	32.2852
	47.1224	30.7999	28.9119	22.3947	31.4795	24.834		62.4555	44.3967	31.5188	38.3326	35.699	32.8147
	47.1087	34.5486	29.697	23.9382	33.3768	27.1062		62.8852	46.3462	32.2217	36.2202	34.5904	34.9811
	49.8128	40.8006	31.9835	27.8148	37.086	31.9734		62.4377	48.5269	33.8148	35.9234	34.4532	38.2142
	54.9148	47.5325	35.7864	33.7762	40.3509	38.7193		61.1791	49.8613	35.9746	37.4383	34.1127	41.6062

UAM Asian Female													
A full extension	62.9549	49.8905	42.8169	41.8255	44.5255	47.7512	135 flexion	59.1911	51.3131	41.2165	41.5702	44.3512	46.4
	62.3797	48.0077	44.968	48.7638	43.7987	47.1886		58.3134	49.0286	43.2641	48.0151	43.0886	45.5308
	59.9503	45.5551	45.453	53.046	40.6887	43.311		56.0554	45.4517	43.1695	51.8325	39.3472	42.9604
	56.2481	40.3223	44.5849	53.182	34.4682	38.2263		53.6077	41.9733	42.1371	52.6172	35.4034	39.6842
	52.3276	34.1862	41.4857	52.3274	28.7887	32.3951		52.3411	40.1218	42.3967	50.9603	33.3332	37.0818
	48.0008	29.9085	37.571	49.2472	24.8275	27.7968		52.4462	38.6449	42.2563	50.1753	33.2763	34.8425
	43.6951	28.0255	33.6769	43.1383	22.8795	24.6565		52.2453	36.4581	40.4366	46.1855	33.843	32.4281
	41.6854	27.6397	30.5187	36.7986	22.7973	22.4927		50.6134	34.2273	37.9142	38.9459	32.9785	29.5613
	41.5281	27.1631	27.9355	31.3577	24.2856	20.9271		48.6563	33.3998	33.497	31.7404	32.2224	26.7177
	42.7751	27.1435	25.7957	25.6164	26.2369	19.6467		46.8908	34.3606	29.8802	25.7526	32.0608	23.915
	43.5872	28.6759	24.5428	21.8394	27.4762	19.4503		45.9657	35.0802	27.683	21.6156	31.4231	22.222
	43.8772	31.8556	24.714	20.0845	28.676	21.0618		46.1129	35.2718	26.6372	19.6	30.4766	22.2634
	45.5566	36.1685	26.6147	20.1075	31.7076	24.937		47.5904	36.0541	26.7405	19.4109	30.7766	24.1638
	50.2624	41.0021	30.0872	21.9982	37.072	30.9094		50.2219	39.5168	28.3698	21.1043	32.891	28.2238
	57.4367	46.2167	34.2477	26.2466	41.5777	37.5881		53.7177	45.1298	31.7279	25.2733	36.908	34.7867
61.2514	49.3197	38.4174	33.4502	44.5842	43.0949	57.2551	50.1943	36.7244	32.6941	42.011	43.0742		
90 flexion	56.3767	52.711	36.3557	38.2616	41.9353	42.1559	A full flexion	38.9188	49.5087	20.9456	20.1389	24.0649	26.9483
	56.5646	52.199	40.2897	43.8901	41.9058	42.6891		40.3746	49.3911	23.6636	22.8446	25.3276	28.2444
	55.1651	48.5559	42.565	47.5612	39.4116	40.8927		43.5993	49.3327	31.8823	28.3586	27.7603	32.2086
	54.0401	43.4416	43.7447	47.7049	36.6919	38.8378		49.9013	47.6303	44.6221	37.0708	31.7476	37.7736
	54.412	39.2521	44.6162	48.3255	35.4086	38.5841		57.641	45.525	48.9853	46.3239	38.0004	42.2312
	56.6966	35.4641	45.8595	51.9816	35.5848	37.9913		64.2263	44.5936	50.8187	51.4982	42.98	42.7506
	58.2642	33.0136	47.4814	53.0017	36.8384	35.6472		68.2111	44.3761	51.0061	55.2532	42.8911	42.5325
	57.8078	33.2423	46.1616	47.3659	37.4962	33.9212		67.8419	44.9387	49.6788	53.0515	43.0564	40.8138
	55.7616	33.4824	40.8739	39.8114	36.3769	33.6706		65.9364	45.3757	44.8083	49.0205	43.2303	39.6276
	52.2741	33.3598	34.838	30.9157	34.1808	30.9509		65.1357	44.3109	38.8781	47.8252	43.7185	39.0807
	47.9987	33.5973	29.7986	24.8627	32.1993	27.2701		63.7556	43.3987	34.9253	44.2479	43.0149	37.3803
	44.9035	33.6105	26.4329	21.202	30.7024	25.4835		59.6149	43.3527	32.9817	36.7425	40.0761	35.942
	43.7484	34.7125	24.8709	19.8939	30.542	25.4104		53.1015	44.3967	31.1153	29.5125	36.0768	34.1915
	45.0635	38.1218	25.046	20.8677	32.1686	27.1673		46.4244	46.3462	28.389	23.9891	32.3899	32.04
	48.6879	43.8929	26.991	24.6286	35.4772	31.4617		41.5341	48.5269	24.3026	20.7442	28.1604	29.6867
53.2314	49.9098	30.9899	31.2839	39.1987	37.5664	39.0776	49.8613	21.2748	19.5221	24.9635	27.7413		

E Asian Female													
A full extension	43.6265	33.16234	28.30287	31.58018	32.53596	28.55176	135 flexion	44.8596	35.4252	31.38215	33.90832	35.19522	33.177
	44.7190	34.33664	30.25548	32.87977	32.90452	29.69989		46.0287	35.4725	32.85049	34.87242	34.39937	32.29817
	48.8698	37.57507	34.71619	37.35965	34.83669	34.28896		49.1769	35.8986	35.63748	37.18884	33.83732	32.7121
	52.7575	40.54987	38.14259	41.34999	37.23017	37.7719		52.5202	37.0514	37.08604	39.97287	33.91562	34.211
	53.9672	41.75948	37.50193	41.05459	37.54473	37.55699		53.0299	38.1405	37.97895	41.93074	35.06303	34.4895
	54.1787	40.92705	34.18297	36.52562	34.2486	34.01847		49.7784	38.2570	37.22117	41.22499	35.9081	33.63067
	49.2430	36.78893	29.45078	34.08384	32.18582	30.19754		46.7219	37.6350	35.4629	37.87171	36.50904	33.31056
	46.5220	33.72789	29.32758	32.99569	32.88503	29.23569		45.7483	37.3271	33.76265	36.87963	37.15498	35.52579
	42.3558	33.40779	27.47342	31.36547	32.10851	27.68533		43.4670	33.5847	28.68805	29.33638	33.03614	29.8898
	37.3803	33.73637	23.18327	28.63254	27.47619	23.7945		35.9880	27.5062	23.38591	25.23031	26.44505	26.51089
	34.0699	32.17028	19.92921	26.03424	23.95546	23.2865		38.8620	25.0014	22.74046	26.61757	24.48078	27.2396
	38.5091	32.7603	22.6214	31.33039	27.13306	28.29595		47.8163	29.6711	29.38427	32.92485	27.60611	30.83428
	50.6977	40.79611	33.83145	40.41127	36.44491	37.34492		53.1881	37.6029	37.59852	40.73866	33.19098	34.24456
	56.8380	44.0978	40.23437	43.01034	39.23269	38.4179		53.1924	40.8426	38.86933	42.11563	37.95497	35.689
	53.3913	41.24642	37.03879	38.71563	36.8455	35.01974		49.5872	39.3343	36.50622	39.41041	38.33032	34.986
46.8628	35.89015	30.44848	33.84754	33.99873	30.79111	46.0001	36.1707	32.67742	35.30771	36.51296	34.16034		
90 flexion	48.35246	46.63623	38.24129	43.84171	43.16001	37.21261	A full flexion	55.66811	47.39202	44.21448	48.08351	43.99584	41.78844
	46.58469	42.68492	36.82584	40.27815	41.44677	35.43293		54.65936	46.45007	41.38571	45.86415	43.65448	38.9516
	46.10054	38.93375	35.96863	37.30145	37.86459	34.43198		54.80461	45.53891	39.52088	44.32913	43.04257	37.35139
	47.33097	37.26419	35.55748	36.07794	34.94305	35.15904		56.31731	43.47263	38.93205	44.07169	42.18568	36.89171
	48.76173	37.67457	35.65484	36.67773	33.93119	35.4801		59.30865	39.76275	37.51494	45.1544	41.26766	37.0868
	48.96775	39.84032	35.93935	38.84454	34.02396	35.05022		60.3676	39.44397	36.03489	45.68153	41.53512	37.50553
	47.2215	42.53285	35.48453	40.91891	35.17707	34.3449		58.12566	43.21564	39.4841	46.90906	45.73826	40.42493
	48.78487	45.61381	37.90569	44.11146	39.13237	36.19915		57.07221	48.79686	45.74994	49.09596	47.44812	44.36954
	48.29794	46.21797	38.21719	43.54543	42.47106	36.6673		53.75631	45.77362	43.24876	47.56616	42.0141	41.23042
	44.46392	39.7261	33.04465	38.91059	36.25509	32.49429		46.12735	41.63269	37.82973	41.37672	37.6792	38.18209
	43.13123	36.31792	30.69971	36.54857	33.36318	30.89002		43.21532	36.72385	31.81004	34.42409	31.34231	32.58028
	45.01982	35.8071	32.12521	35.80602	32.401	31.77412		49.61174	33.82656	30.14578	33.25551	33.65513	29.37672
	48.61159	37.54396	34.89862	36.74062	33.40466	34.36546		57.79067	38.57794	34.226	41.42076	40.63332	32.91307
	50.61351	40.88482	37.73433	39.80154	36.32086	37.43939		63.03936	44.42135	41.09882	49.39635	43.3286	40.24001
	51.19499	44.43531	39.75017	44.40313	40.16045	38.99672		61.32583	47.674	45.65268	52.58949	43.24535	45.14865
50.49339	46.6765	39.71261	45.62524	43.08531	38.54362	57.81856	47.73884	46.55299	50.53784	43.67616	44.71589		

LAM Asian Female													
A full extension	55.9348	40.7759	41.0946	42.8108	46.1044	43.4992	135 flexion	47.3554	40.6490	37.0547	40.767	37.2959	36.8249
	56.6106	39.141	41.3809	46.5638	42.1946	42.1935		50.1783	38.0564	37.3318	41.7314	35.9489	36.2597
	54.6966	38.0467	41.2556	50.0748	37.8828	39.4192		52.3234	35.6940	37.3448	43.7046	35.0334	37.0646
	49.1452	35.2037	38.5028	49.4995	33.5332	33.5113		53.3578	33.8128	35.659	45.2096	34.0824	36.8693
	42.7794	31.0455	32.1732	44.1669	28.0508	25.7939		50.2287	31.1681	32.8076	45.8934	32.4085	33.3565
	36.2259	26.7227	23.1101	36.2997	22.6563	20.0867		44.3671	28.0303	28.722	42.1231	29.8442	29.3426
	29.5321	23.6068	17.7236	29.8601	19.5305	16.1821		38.3535	25.2634	24.2847	34.0382	26.6647	25.9455
	24.6371	22.0213	15.1595	24.9611	18.3356	14.1601		33.6462	23.3306	21.567	28.7234	25.3812	23.7803
	22.6872	22.0477	14.5617	20.1147	18.4683	13.6609		31.1183	22.5803	20.7539	27.1634	24.8558	22.9322
	23.6796	24.4218	15.5938	16.786	19.8295	14.6151		30.8088	23.7052	22.022	27.9299	25.1608	23.6585
	28.1503	29.1047	18.5098	16.4463	23.0932	17.5123		32.6986	27.0873	26.0671	29.4422	27.6464	26.2305
	35.9565	36.5006	24.117	18.8965	29.4892	23.7287		35.9429	33.3217	32.4965	31.4165	32.458	30.0989
	45.7019	44.9046	32.2739	24.4882	38.3241	34.0696		39.3952	41.8182	37.0871	33.603	37.2739	34.2596
	53.3601	49.3755	38.2644	32.4421	46.7052	44.9829		41.7621	46.2312	38.7708	36.3164	40.665	37.1012
	56.8414	47.4771	41.0792	38.917	50.0877	47.0817		43.2790	46.5073	38.2808	38.9393	40.8768	38.2243
	56.8565	43.7549	41.3207	41.6219	49.2417	45.4389		44.8204	43.3564	37.3011	40.3813	39.2588	37.7141
90 flexion	47.117	41.9943	35.5669	39.4167	31.1082	31.4019	A full flexion	39.807	36.4303	29.7472	31.1773	18.5336	19.5858
	46.1366	40.2636	35.4121	42.0389	30.5489	30.9876		43.5212	36.5435	33.5462	36.7373	19.0302	22.4772
	46.7831	37.1679	36.8934	46.7922	30.575	31.4514		47.5919	36.7906	36.7002	42.1931	21.0405	28.06
	47.4547	33.4022	37.7186	50.1949	31.4266	32.3428		52.0222	37.9479	38.9285	44.5859	24.6948	34.4212
	44.2534	29.5875	36.2301	50.0144	33.3112	33.1923		54.6312	39.1427	39.4747	45.9725	30.275	39.2087
	40.045	26.3672	32.1688	46.6893	33.7183	32.0678		53.7913	35.8773	35.7669	44.9393	35.253	41.3332
	36.1207	24.4161	26.6727	39.3162	31.9931	30.0231		48.1431	31.6629	28.2453	39.4189	35.9307	39.7006
	31.8971	24.34	23.4295	32.7888	30.0482	28.0746		43.4802	27.7474	22.4842	32.5805	36.0406	37.4408
	30.029	25.4815	22.4541	29.5514	30.0666	27.5338		42.2874	26.3945	20.6355	30.4269	35.5173	36.7062
	31.3056	27.7684	23.4085	28.9113	31.1474	28.8604		44.9145	28.5218	21.6609	31.0093	38.492	37.676
	34.5149	31.2966	26.0414	29.0688	32.5282	31.8345		51.143	35.8779	24.9727	32.6781	44.1443	39.134
	38.6864	36.1276	29.7183	29.7454	34.0072	35.5067		51.7762	42.2508	29.5216	33.7807	49.1377	38.4383
	43.041	41.0576	33.3667	30.9603	35.2026	39.016		44.9283	42.2227	32.5582	32.8614	47.6769	32.5905
	46.574	43.2447	36.0663	32.6836	35.4862	39.864		38.0137	40.2974	32.0536	30.6901	37.199	25.5274
	48.5109	43.7648	37.0887	34.8615	34.4895	36.8092		35.6582	37.9499	29.8148	28.8542	26.0801	20.759
	48.7943	43.0683	36.572	37.1391	32.6163	33.5229		36.5041	36.6871	28.6169	28.6049	20.2236	19.0051

LAF Asian Female													
A full extension	41.0889	29.8855	33.5462	34.0957	37.0077	35.2344	135 flexion	34.6881	32.6331	30.7445	32.5445	28.873	31.6243
	41.3938	27.0465	34.9228	37.0921	35.5221	33.7357		37.6072	33.2334	31.8346	34.892	29.4833	31.3056
	42.1596	24.7798	36.6706	40.5676	33.7829	32.5728		42.6448	34.4651	33.3446	38.3631	31.052	30.9027
	42.1188	23.8541	36.9026	43.0702	31.3235	31.3769		47.3437	35.5551	34.4518	41.0466	31.419	30.6023
	40.1440	25.2071	33.4843	45.0836	27.8103	28.7424		47.2360	34.9534	32.6959	41.928	30.761	30.1138
	36.8775	27.543	28.319	40.0198	24.2712	24.6794		42.3434	30.8835	29.2844	41.3938	30.1266	28.8033
	33.2772	28.9071	22.9382	33.3109	22.1165	20.9646		36.1362	26.6624	25.8083	35.9788	29.0642	25.8598
	30.4106	28.5904	18.3686	29.5077	21.2193	18.6334		32.2564	23.6216	21.434	30.7558	27.2677	23.3586
	28.8438	28.4469	17.2519	27.664	21.3146	18.039		30.8119	22.3284	20.1032	28.9464	25.6768	23.2637
	28.7326	31.1664	18.2532	25.8463	22.6009	19.6314		31.1003	23.3432	21.5551	28.7368	25.8187	24.8111
	30.1659	35.3084	20.8299	24.8894	25.1936	24.201		32.6135	26.0008	24.891	29.2232	27.7853	27.4028
	33.0429	38.1538	24.5508	25.3646	28.9352	30.5802		34.4042	28.8520	27.8968	30.0021	30.1416	30.1296
	36.0321	39.3116	27.9398	26.509	32.9425	33.6745		35.4207	30.5223	30.1329	30.895	31.035	32.2315
	38.8412	39.2304	30.6751	28.0058	35.8102	35.4975		35.8293	31.2337	30.9849	31.7337	30.8758	32.457
	41.8739	36.7255	32.2117	29.7588	36.9388	36.4485		35.0962	31.8960	30.2791	31.5207	30.0564	32.1333
	42.2641	33.2691	32.8527	31.7533	37.4428	36.3733		34.2424	32.2211	30.145	31.4177	29.2143	31.931
90 flexion	37.9754	32.8125	27.9794	29.9345	24.0649	26.4108	A full flexion	32.0354	35.6966	26.6149	28.3889	17.9978	18.4084
	39.4145	32.9001	28.5211	34.7359	24.465	27.2734		34.5287	35.9443	30.1781	34.8687	17.6761	20.8267
	41.5247	32.9446	30.2973	41.4364	26.1523	28.6843		38.4436	35.6862	33.3977	41.2393	19.034	25.1026
	41.5025	32.2291	31.3817	47.3402	28.7851	30.0353		42.9621	34.8994	35.2123	43.699	21.8577	30.0084
	39.0424	30.2537	31.1861	50.3717	31.4254	29.9184		46.5892	34.3295	35.2356	43.7073	26.0211	34.2138
	35.2779	27.2732	29.5641	47.2264	32.9179	29.0896		47.1916	33.624	33.3155	42.1566	30.5102	36.9057
	31.9539	24.5193	26.2366	39.7626	30.8634	28.2669		44.1311	31.2451	26.8681	35.311	34.0601	36.615
	29.8603	23.0866	23.0884	31.8271	29.4537	27.6759		38.6811	28.3536	21.8622	29.0716	35.5632	34.7757
	29.4526	23.0941	21.6921	28.7182	29.9583	27.7959		36.8353	26.831	19.8715	26.2926	34.96	33.5829
	31.0011	24.6489	22.7079	28.2462	31.8671	29.1181		39.2084	29.0053	20.2698	25.5428	37.8736	33.4058
	33.928	27.8242	25.1811	28.0037	33.6756	31.9539		42.1672	33.2025	23.1924	25.4546	42.3984	32.6739
	36.7595	32.2619	27.7831	27.231	33.7117	33.8805		42.6415	36.9208	26.2697	26.1093	43.3061	30.7248
	39.1227	33.7556	29.7831	26.4621	32.1994	33.0091		41.9268	38.6482	27.6215	27.1083	39.2691	27.3902
	40.805	33.4116	30.4679	26.787	29.994	30.4527		37.6283	37.918	27.073	26.2225	32.8026	22.3473
	39.6362	32.827	29.8129	27.5669	27.511	27.9536		33.1323	35.8947	25.5983	24.7068	25.8638	19.0162
	38.1938	32.6425	28.6492	28.0828	25.1768	26.5651		31.4095	35.1727	25.2168	25.1676	20.5091	17.8445

UAF Asian Male											
A full extension	55.7712	55.63955	43.26953	53.65218	49.50011	135 flexion	58.0455	56.4402	42.26707	52.16558	48.35183
	60.5575	55.2385	48.68945	55.71532	50.22956		61.7575	58.4907	47.3568	54.2835	51.80329
	60.1201	50.25542	51.00618	52.82641	46.89639		59.5702	53.2543	47.59948	50.1845	50.53342
	55.9715	44.20867	49.29173	45.63886	44.51125		56.0891	46.2648	45.9615	44.44744	46.26564
	52.9074	40.67106	45.16949	40.12073	43.13367		52.0117	42.1713	44.59751	41.19514	44.12934
	52.3780	38.66513	40.64458	37.13202	40.85708		48.3463	40.8810	44.6314	40.58	42.13665
	50.0756	38.96874	36.15535	35.65734	38.30655		44.8701	41.5333	43.49351	40.05252	40.14512
	43.0896	41.07453	31.44485	31.32171	34.29286		42.1463	40.7023	40.56425	38.65168	38.05554
	35.8670	40.75947	27.59313	27.91006	29.62025		39.8958	37.8333	36.03707	36.26139	32.62017
	31.2383	36.92553	24.08563	26.39379	26.92066		34.9006	34.9434	30.61298	33.06215	27.14536
	28.9974	33.46113	21.53334	25.56247	25.96687		31.4251	34.3135	26.85263	30.18093	24.37304
	28.6601	32.9178	20.41046	26.40756	25.19397		30.1349	33.7943	24.88562	29.03837	22.83309
	30.0741	34.35537	20.77895	29.08357	25.49316		30.9835	33.3965	24.41638	31.0822	23.39224
	33.4207	38.45255	22.85201	33.07057	27.80626		34.1586	35.9974	25.32364	34.85772	26.10309
	39.0618	45.08487	27.11746	38.52927	34.39055		40.0902	41.5906	28.27976	40.01025	32.62267
47.3858	51.29435	34.27102	46.38782	44.15087	48.7376	49.6705	34.08196	47.33287	41.70865		
90 flexion	58.81077	57.09024	38.09956	52.75838	44.54719	A full flexion	55.41804	47.17094	37.51497	42.72645	32.2798
	63.33062	57.01914	46.8498	51.4309	48.08719		56.65598	48.44335	40.05237	42.09533	37.29796
	62.74062	51.37689	50.45707	47.1686	48.40798		58.45573	49.03443	42.2141	41.17449	40.21561
	56.61641	45.10781	50.58004	44.0154	47.02629		59.0384	48.81065	44.11621	40.84678	43.26008
	51.89744	40.64052	48.98882	41.19385	45.25003		58.03302	48.85565	47.74778	42.07449	47.14877
	50.23911	37.69253	46.43534	39.64154	44.61685		57.53512	49.86686	52.14814	45.2688	52.05694
	49.77332	36.19334	46.36992	39.40119	45.00805		55.04054	51.51265	54.92067	48.38641	55.15368
	45.84011	36.04787	44.95238	39.01117	43.91766		51.4038	51.92189	53.606	48.33247	53.69099
	38.77866	36.78353	38.43217	37.88799	40.23202		45.73246	49.94534	48.85524	46.69633	49.1296
	32.84993	36.55158	32.27875	35.69109	33.303		38.92782	47.59975	40.11986	43.7173	41.65164
	28.45182	35.62189	27.84662	31.30346	26.77789		35.54139	45.11135	33.12446	39.94859	32.83626
	26.49121	34.91949	24.86621	28.6615	23.36616		34.69707	43.98028	29.10554	37.19379	27.11911
	26.98758	36.07012	23.29749	28.9009	22.41243		36.29214	42.99985	27.48512	36.60885	24.34787
	30.09841	40.28752	23.66009	31.70287	23.66625		40.49474	42.69365	28.1994	37.69873	23.70138
	36.54387	47.27213	26.56624	38.74296	27.71388		46.80782	43.54636	30.84048	38.96463	24.83397
47.07533	53.73463	31.10263	47.66105	35.93973	53.37694	45.45724	34.15772	40.80417	27.69724		

UAM Asian Male											
A full extension	57.7972	55.42372	46.33686	52.65467	50.3282	135 flexion	48.6550	53.2882	44.03234	49.57948	41.20849
	60.3678	52.81383	49.63541	51.43255	53.72784		52.3692	53.6267	47.41186	49.80788	42.8872
	59.3532	48.25585	49.45608	48.56641	51.36893		54.7607	49.8342	47.38151	46.12072	44.7128
	53.3295	42.80729	46.978	42.80685	44.45781		52.5926	42.6040	44.00822	42.83909	44.66669
	45.5023	36.6032	41.84219	34.33888	36.01601		45.9600	37.4407	40.61028	37.70301	42.12227
	38.6260	32.19381	35.12766	27.21931	29.79409		39.2863	35.4217	37.58955	34.61973	42.3021
	32.7984	29.97234	28.38951	25.40258	26.00494		32.6905	34.5947	34.30391	32.4159	41.09956
	28.7735	29.08795	23.43979	25.57514	23.15314		25.9083	34.3519	30.85758	31.09679	35.24147
	26.7790	28.93611	20.2862	25.14907	21.65307		23.5701	33.9076	26.17825	30.78695	30.64858
	25.8889	29.03543	17.99212	25.01919	22.31978		23.9892	32.3673	23.17427	28.61913	27.19515
	26.5810	30.34323	17.46582	26.07913	24.63192		26.4566	31.9607	21.56775	26.58135	25.22473
	28.8813	32.9454	18.96419	29.12719	28.38691		30.5884	31.7455	22.09678	27.16863	24.77034
	32.2568	37.38759	22.67003	34.6078	31.57041		36.0533	32.8855	24.00614	29.58636	25.57289
	37.8429	44.13772	28.51684	41.67959	34.83667		40.9519	35.7377	27.20807	33.75418	28.18612
	45.7638	49.53604	34.53271	46.04377	40.92786		44.8174	41.1192	32.22837	40.6379	32.3105
53.0884	53.61041	40.42553	49.32203	46.86116	46.8922	49.7223	38.27336	46.63952	37.09735		
90 flexion	56.1682	50.53942	37.52055	45.74145	40.57915	A full flexion	33.67977	37.35518	29.05032	36.92862	20.98079
	60.56608	50.54217	44.85803	45.61101	43.78543		38.16875	37.90139	31.76153	37.05986	23.27297
	59.06781	46.53439	47.71608	41.26502	44.2395		46.64934	39.56828	35.24284	38.41568	29.12179
	54.26493	41.66615	48.40625	38.28774	43.76241		54.34785	42.66584	39.48932	40.74567	37.20376
	50.24637	38.96045	46.17439	38.37293	43.41861		57.79632	46.42508	46.36443	43.19297	44.55459
	45.7104	37.90805	44.25132	38.36083	43.40786		57.7725	49.79649	51.33905	45.33179	49.19
	42.05339	37.49033	42.78112	37.1197	43.32973		54.40653	50.89794	52.21932	46.32413	53.58661
	37.60156	37.07189	38.77191	35.5885	41.3324		47.38868	49.29626	50.74815	47.00738	52.55627
	31.93007	36.57915	33.57686	35.04315	37.91087		42.89037	49.16541	46.72541	46.00327	46.55015
	27.25276	35.56984	28.5277	33.62462	30.80345		40.60881	51.41606	39.98185	41.63651	38.21427
	24.91191	35.00777	25.09394	31.53115	26.58325		39.70996	50.59073	33.35035	38.02143	31.88124
	24.82987	35.55926	22.95108	28.97329	24.57319		39.38698	49.28494	28.33302	35.98228	28.0124
	27.10147	37.55692	22.10935	28.05558	24.28733		39.10954	45.80261	25.81104	35.24589	25.97805
	31.64531	41.14846	22.53161	29.30005	25.65296		38.44241	42.20334	25.25539	35.68213	24.19064
	38.29476	45.77232	24.63295	33.17245	29.12212		36.71698	39.41467	25.68958	36.7591	22.56962
48.37729	49.35749	29.74654	39.88915	34.85184	33.78202	37.78098	27.05477	37.06462	21.09798		

E Asian Male											
A full extension	35.0820	34.57603	49.257	34.84122	33.26593	135 flexion	39.8465	37.9257	35.55234	36.86808	35.57871
	36.4554	36.3549	51.4847	37.75841	35.79496		40.3044	39.2430	35.26848	35.24007	34.93032
	40.0437	40.71183	57.1048	42.76079	40.33049		41.0012	42.7293	36.01641	35.81138	35.93622
	43.6989	44.60605	62.4443	45.98015	43.64458		40.7578	44.0239	37.25725	38.91446	38.51247
	46.2854	44.66952	64.325	43.92413	43.3176		41.0246	42.6452	37.9833	38.89226	39.74001
	46.9156	41.32464	62.5204	38.16756	40.30057		41.7039	40.6092	37.99438	38.48633	38.8368
	42.0832	37.56999	56.4136	34.72651	36.962		42.8618	39.3520	38.49859	38.57931	40.27708
	37.3859	36.57085	52.2985	34.95066	35.40209		43.1309	40.0320	38.05792	39.60874	38.5624
	33.2548	33.13645	46.9458	34.98668	31.29842		35.7400	37.9202	33.08607	36.59561	29.82908
	28.0796	26.1183	38.3488	31.26481	26.67513		33.3068	33.3152	28.01578	30.93348	27.21051
	26.9401	22.93907	35.3832	29.45007	24.71358		35.6538	30.6663	24.83715	26.47196	28.67399
	32.5355	29.62193	44.0002	36.42816	30.38309		38.8994	32.4366	28.02789	26.2184	33.26397
	46.5077	44.30104	64.2304	44.38032	42.21428		40.7492	39.3514	36.43682	33.61784	38.70316
	47.1361	43.83024	64.3654	44.17678	43.54708		42.8759	46.4801	40.06046	42.74447	41.01576
	42.3284	39.76903	58.0799	39.6645	38.48096		43.2739	48.4802	39.62049	45.33251	40.95581
	37.0866	35.82657	51.5651	35.53106	33.61837		41.2793	41.9464	37.45961	41.41768	37.75886
90 flexion	47.05771	46.94079	44.2104	45.30642	43.27918	A full flexion	49.0584	56.9689	30.62143	50.70168	52.54985
	44.02187	44.81418	40.69867	41.92187	38.14609		48.9468	57.06679	33.1465	49.44192	48.417
	41.52629	42.83968	37.37945	38.88447	35.55725		49.4957	54.05186	38.03431	49.56457	45.63997
	39.95341	40.80592	34.87428	38.90013	35.8368		50.0762	49.1168	41.23051	48.37098	44.57091
	40.76225	39.20769	33.92379	40.48055	38.80323		49.9552	44.31605	39.92154	46.35058	44.34585
	41.63639	39.10788	36.11903	42.82855	42.21454		49.5121	41.83279	36.83784	46.03511	47.21946
	42.21324	41.34345	37.87696	45.02365	44.84634		51.0116	44.46276	33.7474	49.91768	53.60559
	45.63115	45.37939	39.64255	47.3133	46.15706		52.6536	52.93973	31.68969	53.39751	56.46702
	47.39716	45.972	43.74595	41.89162	42.31307		46.8692	56.03005	30.40737	49.64008	51.38319
	41.39142	36.92627	41.74198	37.10794	35.10925		42.1055	53.06744	26.22479	43.35482	46.29518
	36.43003	33.42628	38.22983	35.98348	32.85078		36.0339	43.64956	23.47173	36.70461	37.77112
	35.89567	33.64948	34.98553	37.51705	34.4904		37.5426	39.75875	24.48068	34.05132	36.45185
	39.14787	37.10503	34.00817	40.16633	38.81669		49.6449	43.9097	35.8325	41.47633	40.51993
	45.14057	43.04888	36.04598	43.13484	42.95999		52.5725	48.34276	42.2932	50.33227	48.16106
	49.55563	47.82549	40.47271	45.78215	46.68167		51.7652	52.06762	38.0144	56.32806	54.85514
	49.64009	48.6805	44.32293	46.67709	47.03045		50.1556	54.82895	32.56698	55.4788	55.56077

LAM Asian Male											
A full extension	54.5174	49.94349	45.54114	48.40932	41.57594	135 flexion	48.7319	49.0003	41.25422	45.5217	39.92015
	53.2305	49.84536	47.28719	49.39635	44.03856		52.4757	49.0760	42.48608	44.47413	42.68317
	52.9111	48.30856	50.0769	51.41693	47.2462		54.7638	46.7979	47.32391	45.3651	47.11895
	49.9510	41.85145	47.29397	49.29976	46.11102		52.4641	41.3420	49.34782	46.88866	49.85619
	44.4534	32.03689	39.73662	42.52274	41.04333		45.7522	35.6187	43.70827	45.25673	45.21056
	37.8752	24.09362	31.40351	34.10345	33.95005		39.1486	31.5723	36.54809	40.35252	39.61741
	31.4843	19.10901	24.59686	27.1177	28.72481		32.4615	28.5989	29.89149	33.05109	34.99776
	25.4220	17.28066	20.6157	23.77507	23.08488		25.7971	25.7119	25.0251	27.57294	29.85448
	22.4879	17.22004	18.05662	22.95212	19.03436		23.5502	23.3392	22.24384	24.48857	25.85015
	22.3610	17.98338	16.75309	24.56062	18.20282		24.0306	23.1394	21.18935	23.91105	24.94911
	24.7307	20.44729	17.03605	29.31075	20.93245		26.5455	25.7666	22.96302	25.97038	26.60887
	29.6286	28.1037	19.41021	38.49437	29.43894		30.7211	31.5961	28.17581	31.17791	32.40764
	36.8234	39.93293	25.72594	48.472	40.92829		36.2023	39.7900	35.13958	40.26869	36.89347
	44.8443	51.42253	36.99893	52.27367	46.37572		41.0654	47.3398	39.3131	50.77548	39.20189
	51.6283	56.29419	45.11614	50.91704	44.50255		44.9044	51.3247	41.08626	52.52202	39.56045
55.7042	52.73411	46.25248	49.06554	41.82602	46.9249	50.0589	40.86089	48.74126	38.76333		
90 flexion	45.73355	51.37178	37.56992	42.4864	41.57743	A full flexion	36.02981	35.80422	24.90453	32.15349	35.75743
	47.26528	50.48232	38.9683	43.1653	43.93573		38.18965	36.30794	28.27953	34.72122	36.45837
	50.10014	47.60997	41.04597	45.89548	45.88974		41.82857	39.26254	37.53459	38.8911	40.49292
	53.88623	43.80692	43.80082	47.28645	47.25419		46.15115	43.35889	46.30041	42.20614	46.25967
	55.63068	40.48709	46.11693	44.95016	46.08561		49.93883	45.76266	48.47526	44.17099	49.23031
	53.91597	37.00918	43.83166	40.66031	41.29426		49.60321	45.65588	46.78579	45.62712	50.13936
	42.2222	32.24669	37.67357	35.64091	36.49208		43.46919	40.92308	41.6102	46.51125	41.03854
	32.3901	27.58819	31.54264	32.04244	32.02424		38.31001	35.61347	37.38005	43.36559	33.13673
	27.4362	25.13398	27.06591	31.3742	27.268		37.76835	34.40166	35.2505	39.73902	30.13512
	25.7971	25.38289	25.57421	32.52132	24.72953		40.03768	36.65703	37.90811	39.40898	31.96032
	26.55114	27.85719	26.08378	34.48111	25.92848		44.53257	40.28178	41.98562	41.26042	34.23761
	29.5268	32.90771	28.3303	38.40104	30.12418		47.55305	44.75117	41.02019	43.87832	35.54779
	34.47071	40.04813	32.2873	43.49768	33.88051		47.97651	48.3515	36.53448	45.93084	37.77879
	38.98893	45.60669	37.07795	45.80232	36.91468		42.1674	48.808	31.21685	45.41086	39.17301
	42.29089	48.42936	38.27749	46.48258	39.44943		36.585	42.32964	27.4797	38.42508	37.36748
44.69844	50.65621	37.76421	43.96178	40.63765	35.26908	37.16915	24.91262	33.26562	36.22987		

LAF Asian Male											
A full extension	48.3488	43.74902	41.92091	43.90369	40.1356	135 flexion	40.9004	40.1518	35.0793	39.27027	35.28694
	49.2332	42.71927	44.27433	44.7199	41.4351		44.6762	41.4718	37.99032	38.7412	36.4613
	48.6665	42.63137	45.4958	44.77164	42.66523		48.9175	41.9606	41.46823	40.51499	39.39208
	46.6997	40.86658	44.5144	42.74487	42.78304		50.8386	40.5136	43.58622	42.98132	42.65265
	43.4316	36.25442	40.14105	39.16218	39.0465		49.7336	37.7616	42.55983	42.09325	44.04419
	40.3160	29.8548	33.37897	34.58747	33.35962		45.6869	34.6930	37.53146	38.72092	41.71914
	36.0704	25.2448	26.04336	30.86176	29.55489		37.8972	32.0778	30.77344	35.15	35.84897
	30.1949	22.35902	20.2551	28.17346	26.5655		31.7543	28.0859	25.6387	31.95176	31.70101
	27.5901	21.83567	18.57065	26.83018	25.37128		28.8990	26.1625	23.88302	28.89374	29.91596
	27.9202	23.82546	18.80675	27.65991	24.48958		28.2223	27.0454	23.75957	28.29669	29.7375
	30.3977	28.13758	20.08355	30.69302	25.99882		29.0545	29.5133	25.92652	30.48619	31.4082
	33.8940	33.0141	23.15025	35.72612	30.84476		31.1965	32.4017	29.52661	34.50035	33.27836
	38.7030	39.79595	28.85827	41.78106	36.55178		33.5751	34.8832	32.4169	39.10932	34.19706
	41.6004	45.42902	34.38819	45.15854	40.08408		35.1203	37.8327	34.42109	42.35993	34.92975
	45.6695	45.77182	37.91378	44.76194	40.08595		36.7297	38.4576	34.25182	42.82811	35.86801
47.3072	44.56388	39.65544	43.65878	39.4891	38.4690	38.9945	33.95366	41.20755	35.84172		
90 flexion	37.43596	38.59318	33.32003	36.19286	35.74052	A full flexion	33.38957	31.42683	24.44422	31.56118	33.20618
	41.62376	38.93456	35.17318	37.18627	37.23758		33.67085	31.74573	25.98048	33.31074	34.71812
	46.43186	39.14143	39.09037	40.35789	39.94966		35.60556	33.78208	30.8286	37.08061	37.62337
	51.6523	39.74571	42.36077	44.54114	42.8967		39.4487	36.81762	38.579	39.81959	40.94111
	54.72146	40.09657	44.83872	47.1353	44.53086		42.63699	40.035	45.36384	42.54745	44.94662
	51.87007	38.32195	44.83508	46.3036	43.05326		42.97034	42.87158	44.20475	42.46665	45.74173
	43.95153	33.62922	38.20077	41.11431	38.42249		40.2472	39.93903	39.17961	41.01403	40.81568
	34.90963	29.52951	31.37449	36.50101	33.25664		36.30102	34.93804	35.42738	39.98135	33.07867
	31.05982	28.62556	27.44929	34.48577	29.15326		35.45952	33.61614	34.05382	39.489	30.74269
	28.66141	30.02135	27.38142	35.17559	25.42337		37.87349	36.17427	34.36573	40.00751	31.78924
	27.37057	32.89385	29.7955	36.34918	24.1994		40.62832	39.49376	36.10291	40.88135	32.0718
	27.53232	35.51099	32.45219	37.58033	24.67726		41.9213	42.2696	37.81913	41.98551	33.46222
	28.55655	36.35402	32.21693	37.98939	26.1641		41.85896	43.23632	36.53236	42.48796	33.19866
	30.13075	35.92523	31.43453	38.05781	29.09911		40.63227	40.06256	32.32376	40.66069	33.56655
	31.68581	35.95269	32.4405	38.18599	32.99582		37.16247	35.9836	28.26818	36.94688	33.43827
33.95098	37.25042	33.04505	36.90459	34.82504	34.42105	32.85089	25.56441	32.86118	33.10299		

UAF Caucasian Female													
A full extension	69.3094	57.88313	53.09827	38.16811	45.20852	39.6094	135 flexion	70.1311	58.8725	52.36982	41.18644	46.28101	41.83007
	69.8159	57.9154	52.62958	37.86523	44.54191	37.78342		70.1018	59.1215	51.79468	40.57762	44.18341	39.05235
	68.5017	55.35213	50.80717	37.10297	42.06285	35.74319		68.7022	55.9118	50.30973	38.24771	41.52772	35.65956
	64.9590	52.80759	48.43229	35.59849	39.32622	33.97488		65.3502	52.2804	48.20967	35.79336	39.30301	33.33839
	63.0748	52.19726	47.07207	34.65218	37.54707	33.86538		63.3405	51.8953	46.99538	35.40781	38.50682	32.61807
	63.6977	54.00167	47.14831	34.69259	38.13073	36.02602		63.5727	54.1156	47.16725	36.77686	39.52859	34.25484
	66.3425	57.534	50.45729	35.73092	41.56542	38.00873		66.0291	57.7828	48.61585	39.58735	42.33609	38.15316
	68.1632	58.77713	53.6379	37.37227	45.59753	39.01077		68.5011	58.2046	50.91022	42.09401	45.7539	41.90246
	69.4489	57.93401	52.82126	38.20073	44.82796	39.6883		70.1237	58.9242	52.3507	40.88446	46.12764	41.70211
	68.1836	57.67675	50.95476	36.97616	43.1842	38.75858		68.6244	56.2025	51.75425	38.87101	43.3892	38.7899
	66.9014	54.49302	48.22445	35.21868	41.04776	36.44726		66.4916	54.0691	49.23162	36.78171	40.65604	36.22678
	64.5684	52.91047	46.25539	34.37602	38.73739	34.53245		63.8364	52.6142	47.73471	34.75851	38.62739	33.34836
	63.1410	52.23561	46.96888	34.60602	37.61569	34.08694		63.2811	51.9957	47.00439	34.96623	38.39268	32.57576
	63.6486	52.95947	48.78144	35.97911	37.96152	35.30528		65.6800	52.8781	48.72955	37.42803	40.45037	34.23153
	65.9486	54.38028	50.25335	38.30127	39.84245	37.8002		68.3273	54.7953	51.60977	39.45171	44.02753	37.16031
68.5301	56.2443	51.40375	39.11432	43.07421	39.63305	70.0392	56.9668	52.44079	40.83016	46.54147	40.28776		
90 flexion	70.05517	62.20964	53.77081	42.30538	46.47509	42.39487	A full flexion	71.87376	62.98006	52.71383	43.23786	45.516	42.90884
	67.46454	59.98337	52.7457	42.03751	43.86002	40.00273		71.62928	62.92489	52.72057	42.84801	43.93802	40.58265
	65.30411	56.48674	50.68367	39.98305	40.28108	37.20035		69.8093	59.5322	52.31642	41.92065	42.17988	38.51764
	64.02652	53.84745	48.91892	37.75751	37.39206	35.25651		68.06508	55.03484	51.46911	40.38817	40.63447	37.46824
	62.01101	53.07774	48.36309	36.60677	36.8511	35.23416		67.52298	54.20834	51.14129	39.95752	40.18903	37.2264
	62.17561	54.85474	49.36288	37.66248	38.71768	36.48166		68.27504	56.93011	53.04302	40.96371	41.20168	37.8162
	65.53475	58.91982	51.43201	40.29605	42.43684	38.73319		70.0732	60.75787	55.82419	42.97751	43.44544	39.13861
	67.71796	60.08657	53.15992	41.85475	46.17412	41.42171		71.8944	63.80505	54.80179	44.15496	45.54277	41.34349
	70.15091	62.27529	53.77237	42.26062	46.44297	42.56581		71.65934	62.73398	52.67357	43.00108	45.59338	43.00968
	68.46794	59.67051	52.17281	40.42504	43.13292	40.57975		69.82469	61.42156	53.34709	40.57418	44.21788	41.16913
	64.45016	56.51562	49.64867	38.0486	39.54776	37.86819		69.86294	58.91825	53.25936	38.82333	41.47914	38.97039
	62.14573	54.05377	48.57102	36.38564	37.24802	35.62278		68.69147	56.01441	51.95537	38.42371	40.01049	37.83443
	62.16346	53.08344	48.35631	36.4726	36.82328	35.20544		67.46967	54.24787	51.15644	39.59507	40.10461	37.22849
	63.90179	54.4424	49.48455	38.20118	38.86054	37.00484		66.98686	54.37751	51.73882	41.99283	41.82634	38.04233
	67.34321	58.16242	51.83707	39.9384	42.85763	39.98049		68.77762	57.01885	52.56234	44.04807	44.67732	40.34404
69.87195	62.37353	53.43254	41.29835	46.64404	42.64443	71.28093	60.91315	52.80663	44.3477	46.14385	42.52406		

UAM Caucasian Female													
A full extension	59.7184	55.267	48.59355	33.67552	38.35995	34.19447	135 flexion	62.4139	55.2152	48.91775	36.96416	40.50269	36.77361
	56.8651	53.23003	47.45813	34.23552	38.14427	34.29591		60.8272	53.6507	47.12897	36.64952	38.14184	35.66171
	57.4109	50.97242	46.66993	34.8092	37.93828	34.04985		58.6237	51.7536	46.07941	36.5512	36.44025	34.34468
	56.6841	49.66597	45.14177	35.30387	37.38726	33.62761		56.6513	49.7957	45.58125	36.135	35.86581	32.64383
	55.7055	48.79759	44.44987	35.53054	36.80056	33.16958		55.4306	48.2185	44.49301	35.66809	36.14529	32.03414
	55.8275	49.13416	46.28424	35.42485	37.29982	32.99807		56.1074	48.2894	44.73551	35.45837	36.65679	33.69584
	56.4355	50.97105	48.88899	34.83458	38.32718	32.90486		58.5516	50.0976	46.63022	35.42602	37.7596	36.14994
	59.8112	53.3476	49.97675	33.69079	38.23771	33.30775		60.3304	51.9645	48.30909	36.2275	39.72915	37.21852
	60.0939	55.30878	48.69049	33.64705	38.35242	34.16559		62.4741	54.8101	48.94526	36.9884	40.77918	36.77887
	58.8617	53.78131	47.92347	34.28433	37.6233	34.0516		61.3106	54.6329	48.87285	36.29663	39.808	36.25773
	57.0149	51.88359	45.30465	34.03577	37.39742	33.05707		59.0986	51.5939	47.61523	34.78378	38.21614	34.37708
	56.2676	50.18226	43.92636	34.18038	36.94844	32.7749		56.3642	48.8791	46.14029	34.15525	36.59522	32.61832
	55.5817	48.81305	44.3271	35.45237	36.76233	33.14264		55.4017	48.1944	44.37568	35.39661	36.12725	32.11163
	55.8464	50.26183	46.28983	35.58123	37.83227	33.78143		57.7066	50.4426	44.559	36.93888	37.56843	32.79517
	58.1183	52.986	48.5934	34.89431	38.49267	34.21772		61.0884	53.4118	46.6024	37.81689	39.88107	34.28722
60.0409	55.09996	49.45354	34.00542	38.60442	34.17254	62.6716	55.0774	48.38753	37.63471	41.51308	36.05446		
90 flexion	66.29488	59.38603	48.56757	38.72978	44.07691	38.11048	A full flexion	60.25523	54.5581	46.24726	34.13064	36.49023	38.06006
	63.43506	58.29966	48.33373	38.69803	40.69945	36.42702		60.75485	55.33452	47.11607	35.2729	37.32182	37.75721
	61.18417	54.36027	47.63625	37.6983	36.33986	34.32087		62.74835	56.17516	48.83884	36.39568	37.9436	36.61657
	59.64369	50.49889	46.63104	35.86102	34.16654	32.39546		63.68261	55.52337	50.01028	36.74488	38.26632	36.49166
	59.8182	48.06956	46.04745	34.97546	34.30404	32.28193		63.8632	54.32324	50.26648	36.09893	38.68104	37.21557
	61.70649	48.97952	46.1133	35.50352	36.93665	33.8576		63.17122	53.2723	50.35013	35.41725	39.11302	37.75651
	63.73775	53.47517	47.12847	37.33142	41.29421	35.58843		61.97787	52.96222	49.80173	35.69195	38.76568	38.29239
	66.01168	57.20651	48.47622	38.64718	44.53037	37.99007		60.65214	54.42915	47.76545	34.76313	37.40881	38.61519
	66.6642	59.38655	48.64164	38.57562	43.86701	38.06498		60.22704	54.58911	46.21038	34.17385	36.50531	37.91457
	66.00373	55.78982	48.52138	36.88324	41.24576	35.785		61.40971	55.36417	46.75089	34.69195	37.04931	36.75747
	64.67658	51.78662	48.03899	34.90093	38.13263	33.05164		63.18551	55.19399	48.9452	35.41769	38.84205	36.56152
	61.54183	48.9311	46.38955	33.77413	35.09005	32.32914		64.32385	54.56625	50.48447	36.06114	39.45089	36.91044
	59.91734	48.18247	46.01412	34.69575	34.51473	32.40574		63.83707	54.41453	50.22495	36.181	38.68712	37.24522
	61.71728	49.69875	47.49188	36.42404	36.75652	33.42215		62.67511	55.09952	49.41253	35.92153	39.01062	38.01414
	65.44916	52.61794	49.97315	37.74098	41.38472	35.70082		61.14387	56.52764	48.48359	35.19357	38.53328	39.34883
68.10951	56.07713	50.15553	38.46852	44.0467	37.73846	60.84574	56.20036	47.14679	34.3068	36.86559	39.11179		

E Caucasian Male													
A full extension	39.5344	38.51597	39.63667	36.94223	40.10488	35.99091	135 flexion	41.7672	45.2195	41.48009	40.25611	44.71258	41.28424
	42.0357	42.31074	41.69442	39.08518	41.82686	38.84531		41.9423	44.7630	40.83196	39.33188	43.68574	39.82689
	44.8745	50.76113	44.83821	42.70616	45.38401	44.06344		44.0943	46.4421	42.27802	39.94994	43.72083	40.10458
	47.6152	56.72402	46.88902	44.03996	48.42455	46.79485		46.2686	50.4199	45.08308	41.27156	44.62379	41.58244
	47.9564	55.85816	47.56637	43.01049	48.41386	45.80989		46.2853	54.2066	47.70298	42.52852	46.25174	43.72448
	44.5153	50.94401	46.96325	40.66919	44.70258	41.62099		44.2990	52.7653	46.86978	42.59347	48.78007	45.60104
	40.1695	47.45579	44.50328	38.37362	41.86313	38.32463		43.1794	48.8314	43.15786	42.35096	50.25171	46.88724
	39.1072	42.25331	42.54187	37.30577	41.88768	37.66655		43.5082	46.4508	42.18578	43.03121	48.39612	45.6986
	39.7612	36.52357	34.71437	36.84742	37.2055	34.55409		38.1132	44.4598	40.681	38.28198	41.66503	34.6384
	35.5504	33.35183	29.10453	33.98474	30.72617	28.87665		28.7114	36.5418	33.73764	31.99849	31.64296	28.84878
	36.5870	37.76305	28.51875	33.60547	28.16816	27.48594		27.7933	35.5290	31.68911	29.49681	27.37864	28.46059
	44.1512	46.90337	37.27696	36.92881	35.75124	34.63895		31.4310	42.7473	34.76318	35.12691	30.80818	32.12459
	48.0511	55.40252	46.42461	42.01157	46.90896	45.00675		39.9503	52.6480	43.89837	41.2953	42.89906	39.45315
	45.8797	55.11399	49.03477	45.46193	49.59738	47.20212		50.2350	54.6292	50.90082	44.86318	49.59391	47.5977
	41.6808	47.31138	46.32815	44.87801	45.63272	43.18126		49.8495	51.0546	49.11483	45.74171	49.13138	49.27909
39.2149	40.35225	41.45759	39.41217	41.47598	37.49935	44.9798	47.5986	44.38614	43.38149	46.71964	45.35858		
90 flexion	49.20649	53.87124	53.39456	49.62808	51.42327	49.34068	A full flexion	59.83099	55.76831	62.32987	49.93396	59.36215	52.03317
	46.2515	52.04194	51.64041	45.63345	47.0368	46.71829		57.05368	56.05615	59.19729	47.05004	56.57703	54.06757
	44.59705	49.94679	49.36677	42.17619	42.78467	42.21593		54.48353	57.53144	55.32523	46.2765	53.68752	54.04615
	44.79341	47.92618	46.54386	39.7655	39.8852	39.7457		53.94217	57.88809	52.59223	47.72857	51.31247	50.19135
	46.17044	46.78026	44.61423	39.75053	39.08263	38.33088		54.98401	54.40637	50.43254	49.05273	49.89987	44.69424
	47.72587	47.81094	44.53978	41.7131	40.58913	38.45394		56.79265	50.8178	48.64965	49.31727	49.79626	42.27685
	49.58271	50.36903	47.01931	44.05096	44.03031	41.33139		59.11646	49.75547	50.18325	50.64171	55.1686	44.06401
	50.99387	54.13756	51.75414	46.91355	50.43996	47.26881		63.59399	53.67978	57.94856	50.90049	61.34478	49.78349
	48.97347	53.26411	53.20081	50.24798	51.14158	48.58751		58.98093	55.92649	61.03531	50.6428	56.41265	51.9004
	43.1899	52.26088	46.61598	43.12961	42.89808	38.64626		52.28504	57.05395	53.2665	47.51471	49.36282	49.05186
	40.0741	45.53528	42.52389	37.38458	36.72704	33.73598		42.2986	53.76403	44.52221	42.97631	38.91832	44.55571
	41.73499	42.49888	41.57915	35.62901	35.26787	33.16103		44.01531	48.75117	44.09621	39.65856	38.32091	39.39194
	45.50119	45.06135	43.36043	37.61217	37.3499	35.91703		52.67383	53.79838	50.09922	44.11865	45.95722	44.58875
	48.77995	49.83274	48.30611	43.20572	42.25678	41.57562		58.68199	58.65338	53.14238	53.10966	53.97744	49.2505
	51.15774	52.32238	54.83781	49.57589	48.19003	47.24327		61.40422	61.01239	57.03701	57.53385	59.66239	50.35308
51.78624	54.08561	55.72969	51.76078	52.43578	49.65449	61.56411	59.11377	60.82787	54.32263	60.86115	50.70091		

LAM Caucasian Female													
A full extension	42.4222	40.66661	38.09012	28.94929	31.30895	29.16473	135 flexion	42.9180	38.9228	38.26586	31.68031	31.47669	29.49753
	44.1230	41.00189	37.83725	30.7861	32.15783	29.48221		43.8787	39.7209	37.88468	32.425	31.99449	29.71182
	44.6845	42.04932	39.34688	34.68576	34.35657	31.03098		45.8275	41.8898	39.51581	34.76408	33.9594	30.89384
	46.1457	43.71669	42.37567	37.55346	37.03662	33.47826		47.3754	44.9407	41.75234	37.11803	36.7826	32.8387
	49.2020	46.71218	45.26189	36.22673	37.41955	34.81932		48.8667	45.3313	43.97717	37.48409	37.61844	34.55278
	49.9443	49.48646	46.53833	34.22278	36.17596	33.78106		50.3321	43.1971	44.7446	36.21019	36.33629	35.19217
	47.9284	47.0076	44.74627	32.17888	34.32268	30.95256		47.7250	40.2347	43.44026	34.73125	33.75324	34.3671
	44.5060	42.82908	40.09296	29.94687	32.62936	29.5755		43.9915	38.4575	40.5975	33.38584	32.17375	30.9307
	42.5925	40.64323	38.18058	28.96951	31.21653	29.17791		42.9183	38.7973	38.56184	31.12262	31.42418	29.49773
	44.5932	42.21136	39.94994	30.40702	31.22429	29.45815		44.6157	40.6610	40.29976	29.81243	31.12307	30.94006
	48.1309	45.13157	43.92787	32.98332	32.91127	31.06944		49.1577	44.0671	43.11768	31.18214	32.59402	34.09407
	49.3558	46.19217	46.74398	36.58478	36.00142	33.49329		50.7433	46.1420	44.30233	34.76408	35.66934	35.93448
	49.5380	47.55195	45.23284	36.47158	37.44581	34.8177		48.8109	45.2958	44.18494	37.427	37.59282	34.45198
	47.6981	45.86251	43.71414	34.66523	36.19439	34.1565		46.8451	43.0582	44.39899	37.40724	36.76006	33.66625
	44.5300	42.83392	42.02409	31.9634	33.78753	32.10221		44.7095	40.5580	43.01354	35.52917	33.95718	31.91938
42.2401	40.9522	39.6067	29.46631	31.90592	30.14608	43.3357	39.1594	40.49488	32.93941	32.1183	30.20838		
90 flexion	42.26604	39.49742	38.36134	32.98635	31.07199	28.9542	A full flexion	38.29255	41.35342	35.99474	30.76776	28.13433	26.82751
	43.33929	40.80762	37.96793	32.34401	31.41035	29.78967		39.92855	41.59297	37.89126	32.48112	28.85762	28.59102
	45.26446	42.98958	39.14161	32.84309	32.91468	31.9651		43.9691	43.07841	41.6253	36.41543	32.56716	32.44786
	47.61703	44.5795	42.64138	34.42498	34.43501	33.91579		48.49822	45.39993	45.05163	39.19608	37.23499	35.72731
	50.21691	45.86273	44.8063	36.55229	36.20925	35.36439		50.34374	48.50875	47.44159	40.22432	39.99205	37.11118
	51.67011	46.21101	44.19292	37.84156	38.46067	35.96357		48.75974	50.58272	47.72088	39.05211	39.80049	35.94702
	49.08759	44.48102	41.74083	37.36124	37.62761	35.30155		44.73354	47.60007	44.49199	36.29822	35.24682	32.72465
	44.20843	41.62118	38.91861	34.83989	33.06161	30.92419		40.52315	42.65042	38.13719	32.80266	30.14306	28.14136
	42.28612	39.03853	38.36219	33.0402	31.12274	28.87369		38.14936	41.37066	36.06477	30.73634	28.30212	26.70186
	44.04121	37.49157	40.43601	33.40384	32.37243	29.85818		39.11262	42.97958	37.60903	32.37702	29.25957	28.60762
	48.06983	38.19466	42.55145	34.97786	34.95029	33.02418		42.45308	45.79463	41.46886	35.28247	32.21377	32.39037
	51.85137	41.88452	43.63078	36.64247	36.0899	36.1144		47.34832	47.94233	45.83992	38.17234	36.58087	35.75182
	49.93934	45.80468	44.77935	36.80227	36.69517	35.17695		50.3481	49.07185	47.57126	40.19799	39.8902	37.06089
	46.37844	45.44026	45.11514	36.23143	37.03236	33.54016		48.0705	47.31138	45.83832	39.01176	39.74075	34.50399
	43.96043	43.40429	43.48075	35.63119	35.95216	31.58602		43.33184	45.10122	41.9807	35.30268	34.98135	30.6107
42.42128	40.70808	40.2799	34.35815	32.87619	29.78354	39.42699	42.76142	37.19947	32.05482	30.32357	27.57158		

LAF Caucasian Female													
A full extension	36.2485	34.83747	35.01402	28.42681	29.10156	27.02737	135 flexion	35.1782	32.2839	33.42811	30.28106	29.0769	26.10673
	36.2163	32.84286	35.03636	29.17271	29.41521	27.35731		35.6189	32.7861	33.58994	30.7043	29.48206	26.26462
	37.0642	32.08573	35.87391	31.34297	31.57459	28.63382		36.6971	34.7285	34.47967	32.62448	31.06413	27.68923
	38.3744	33.33337	36.85777	34.06139	33.66415	30.18325		38.4153	37.0267	35.98608	35.40652	33.40967	29.84176
	39.0270	36.18249	37.47469	35.75496	34.53301	31.05875		40.0911	38.2705	37.36056	36.20329	34.64423	31.65388
	39.2735	38.32629	39.04476	35.49095	33.6997	31.19086		41.2696	37.4209	38.32305	34.4616	34.0028	30.49115
	38.4936	38.62222	39.24256	32.28364	32.19493	30.91869		40.6529	35.8887	37.60617	32.02943	31.27112	28.31367
	37.2065	36.41791	36.14442	29.55163	30.19483	28.66331		37.4286	33.7903	34.80762	30.52633	29.56888	26.7366
	36.2447	35.09458	34.99807	28.40202	29.21098	27.01228		35.1235	32.2580	33.31035	30.29036	29.0708	26.13666
	36.8247	35.91084	36.62086	28.79607	30.41986	27.79144		37.3009	32.8394	35.1311	31.0432	29.16667	27.62745
	38.5842	37.14475	38.81388	31.1742	33.02573	29.95245		42.1148	34.9450	37.1695	32.60957	30.53501	29.85712
	39.6584	36.88895	39.19262	34.28305	34.63222	31.40819		41.5463	37.1685	37.989	34.54971	32.83457	30.7363
	38.9770	36.82867	37.21498	35.77101	34.51573	31.03599		40.0828	38.2697	37.37084	36.17183	34.58754	31.66563
	38.0167	36.97699	36.10354	35.60819	33.73631	30.2471		38.7642	37.7058	35.85431	35.85441	33.86169	31.21798
	37.0397	36.78949	35.7074	33.33319	32.34224	28.74398		37.0557	35.7597	34.30935	33.8816	31.23416	29.45423
36.4918	36.16668	35.54257	29.69529	30.5845	27.5115	35.5042	33.5706	33.51417	31.42938	29.61448	27.28752		
90 flexion	35.39635	33.89883	33.99202	30.42118	27.99244	26.01315	A full flexion	35.02722	35.21434	35.78303	30.7445	27.56544	24.13273
	35.94823	34.41184	35.13812	31.17412	28.14505	25.80801		34.85941	35.63621	36.5361	30.91559	27.91332	25.23637
	37.53507	35.68854	37.50867	32.90908	29.42812	27.11423		36.83489	37.23755	38.18881	32.00128	29.36978	27.90499
	39.91708	37.82214	40.32506	34.77578	31.49906	29.04365		40.03445	39.47588	39.95952	33.40652	31.75041	30.63423
	42.24965	40.16767	41.93374	36.01811	33.63378	30.92296		42.98515	40.31745	41.39894	34.67901	34.77077	32.10483
	41.84756	40.55223	41.42542	34.93241	34.3652	31.8702		44.1976	39.87121	41.5274	34.85225	36.05142	32.39238
	39.57904	38.29069	38.38123	32.85103	32.53812	31.20371		40.74407	38.27134	40.18472	34.11433	33.82455	29.69164
	36.49773	35.20437	34.95715	31.2754	29.3207	27.58422		36.76885	36.18103	37.42656	32.39221	29.34747	25.93288
	35.39585	33.76686	33.98332	30.42121	28.01547	25.88525		35.19968	35.21503	35.70375	30.68932	27.56453	24.01006
	36.51202	34.21641	35.30077	31.7143	29.23704	27.30167		36.64121	36.22678	36.37624	32.32761	28.28007	25.19158
	40.0993	37.56186	38.28406	34.91492	31.96625	30.36454		39.91966	38.70387	38.56232	34.45863	30.93842	28.41784
	42.63484	39.59378	40.87866	36.40097	33.72514	31.61533		42.62795	40.62695	40.67768	34.92805	34.5818	31.34936
	42.16848	40.27784	41.93924	35.88322	33.83781	31.32037		43.39759	40.25223	41.40259	34.71817	35.21883	32.20245
	39.99309	39.35329	41.06533	34.16761	32.75892	30.30168		41.89413	38.99782	39.58861	34.05588	33.88796	30.92385
	37.82712	37.69479	38.45082	32.69128	30.90219	28.62781		39.29521	37.20516	37.64193	33.02446	31.42008	27.95312
36.11474	35.28381	35.18383	31.17746	28.94979	27.15806	36.87045	35.75569	36.23664	31.60659	28.88906	25.18699		

UAF Caucasian Male													
A full extension	59.9570	59.90526	55.70867	43.27856	46.2051	43.45469	135 flexion	59.3997	62.0216	58.24413	44.28459	48.0226	45.87149
	55.9134	58.81144	53.47238	42.7693	44.8671	43.0508		57.3054	60.7492	54.86365	41.54555	45.58551	44.11346
	51.2905	56.36934	49.83328	40.38451	42.80557	41.10635		53.9474	56.9957	50.67444	38.94135	42.00692	41.43423
	47.9619	53.03548	46.90436	38.10784	40.45498	39.30207		51.1583	52.9443	47.20008	37.33459	39.36201	39.34177
	47.1993	50.75196	45.93532	37.61165	39.83022	38.38605		50.4477	51.3341	46.07107	37.24306	39.18539	38.77116
	49.7840	51.73397	48.19922	38.63353	41.9031	38.97543		51.6504	53.0555	48.26232	38.71229	42.22542	40.07301
	54.1215	54.05052	52.36348	40.40739	45.37102	41.55072		53.8937	56.7335	53.14308	40.96622	46.51029	42.93165
	57.5900	58.96906	55.22661	42.52114	45.50252	42.94649		57.9075	60.3679	57.57154	42.97553	49.11563	45.02206
	60.1598	59.8006	55.60586	43.16706	46.14268	43.45707		59.4870	61.9930	58.42565	44.65881	47.87525	45.78752
	57.6634	58.36912	52.42814	41.02377	45.73106	43.25669		57.1081	59.9386	55.94763	42.49004	45.07531	42.7628
	51.5290	56.64176	48.89537	39.13093	42.42757	41.34877		54.3483	55.4561	51.05011	40.05199	41.77279	40.72662
	47.9927	53.34752	46.2013	37.56767	40.50869	38.93004		50.8714	52.6798	47.11486	38.40583	39.58286	39.03311
	47.2445	50.74159	45.84307	37.58806	39.84113	38.37195		50.3429	51.2869	46.04197	37.29771	39.38654	38.73145
	49.4698	51.33157	48.27983	38.51742	41.80701	39.5825		52.7274	51.5505	48.31065	38.54561	41.73433	40.2913
	54.6709	54.93734	52.40852	40.17433	44.8337	41.27436		56.6568	54.4101	53.30258	42.09632	45.51739	43.01624
59.5120	58.35786	55.10092	42.09108	46.52189	42.70711	59.5785	59.1504	57.888	44.83557	48.25588	45.53976		
90 flexion	62.0202	61.68343	59.38182	48.03114	48.6245	44.31345	A full flexion	66.91576	60.66159	60.54829	46.77598	51.20041	44.55993
	59.9445	58.56142	57.1822	44.92757	44.95026	42.85046		64.4801	60.68528	57.52258	45.88866	50.25945	43.28803
	55.78784	54.18645	52.34553	40.96908	41.10305	40.8141		59.95143	58.86815	53.28327	43.83188	48.75301	42.17794
	51.48711	51.20471	47.7952	38.33012	39.1704	39.26094		56.29431	55.33547	50.54567	41.9808	47.05232	41.14779
	49.25821	51.26333	46.52973	38.5357	39.24004	38.86728		55.58931	52.5607	50.01646	41.8626	46.94336	40.83067
	50.93734	52.07261	49.12164	40.84316	40.84971	39.72892		57.88604	54.18639	52.05537	42.97785	48.45475	42.16151
	56.43983	55.0714	53.20946	44.29426	44.64536	41.54281		62.74738	57.73458	56.24275	44.70984	50.45342	43.95931
	61.93083	60.10525	57.04134	48.01091	48.95024	43.32324		67.75968	60.25777	60.73704	46.02926	51.73154	44.73159
	61.47922	61.63194	59.39695	47.94319	48.85034	44.32407		66.74868	60.60193	60.2427	46.69751	51.22747	44.58164
	56.37216	59.17069	57.16981	44.84679	48.07645	43.28327		64.92335	59.59799	57.47395	44.27475	50.62996	43.87653
	52.92617	56.48394	52.4607	41.50804	43.13494	40.44495		61.09558	58.00362	54.44366	42.67938	49.35771	42.20135
	50.44008	53.11305	47.51216	39.27475	39.5215	38.74922		57.3265	54.56254	51.63472	41.92686	47.85232	41.48739
	49.28349	51.271	46.49476	38.78659	39.1831	38.80363		55.64153	52.56014	50.05153	41.88251	46.99539	40.84281
	50.90984	52.67413	49.09805	40.38643	41.18561	40.20901		56.96638	53.49406	51.3514	42.78253	47.85782	41.15017
	55.28693	56.6974	54.84497	44.22381	45.09739	42.40491		61.19286	56.79324	56.00705	44.38391	50.64378	43.10304
59.91353	60.5165	59.27713	47.8016	48.90098	44.00934	65.19288	59.41505	59.61747	46.01659	51.75505	44.56944		

UAM Caucasian Male													
A full extension	50.0796	51.24838	47.84666	37.43715	39.86985	40.04266	135 flexion	51.3884	55.5406	52.98574	40.18546	43.84703	41.32483
	47.5209	51.2507	47.38359	38.02595	40.69493	40.15709		49.8385	53.6560	49.75251	39.81526	43.17384	40.50875
	45.3649	50.17031	45.34873	39.03494	42.27719	40.64816		48.2216	50.6250	45.71417	38.94292	42.23555	39.54243
	44.6242	48.63327	43.51622	39.31283	43.67619	40.34561		46.6215	48.0312	43.01089	37.42126	41.51621	38.40803
	44.9753	47.00272	43.50244	38.4095	43.97544	40.38704		45.6057	47.0936	42.9683	36.66685	41.33471	37.58125
	46.6944	47.46471	44.78449	38.03669	43.11919	40.86204		45.8484	48.1144	45.242	37.31079	43.1027	37.77014
	49.4957	48.38686	46.45449	38.6096	42.25258	40.68142		48.0391	50.3752	48.45561	39.11552	44.89705	39.14302
	50.5516	51.10998	47.95764	38.5696	41.01085	40.88404		51.2072	52.9174	51.6116	40.89904	45.48344	40.78996
	50.2732	51.16775	47.77899	37.34548	39.80744	40.01673		51.4657	55.5583	53.03345	40.16217	43.3693	41.36226
	50.3926	49.04332	46.29743	37.20343	39.49555	40.04799		49.6244	53.7028	50.85853	39.55679	41.24675	39.88203
	48.1915	48.599	44.60853	37.59095	40.3688	40.27747		46.4439	51.1030	47.32545	38.01255	40.0943	37.62745
	45.9713	48.6995	43.37431	38.00068	42.81518	40.314		45.8927	48.2657	44.55103	36.74964	40.59293	36.73243
	45.0535	46.63894	43.49925	38.48935	43.99369	40.39751		45.6143	47.0941	43.15003	36.62771	41.35281	37.37388
	45.9851	46.36751	44.56027	38.92654	43.42146	40.77136		47.0734	48.3204	44.68895	37.83555	42.30038	39.41395
	48.7805	47.80071	45.3663	39.38941	42.84515	41.06614		49.9136	51.6670	48.58856	39.46231	42.88673	41.46498
50.9032	49.49591	46.78919	38.67421	41.27264	40.75671	51.8476	54.9431	51.80391	40.07085	43.46248	42.00939		
90 flexion	57.17716	57.36782	55.19043	45.34646	47.48816	41.58326	A full flexion	51.81754	52.09658	49.75516	40.62121	44.56701	38.42292
	54.73188	56.71928	51.00328	43.27986	44.86301	40.64114		52.54643	52.00242	49.52158	40.61427	45.09343	39.25767
	50.74563	54.02265	46.73048	40.09398	41.94699	40.09127		52.95522	53.23942	49.69724	41.71431	46.05029	39.98203
	47.53799	50.04239	44.15869	37.82044	39.67399	39.10177		53.25534	53.13364	49.45923	42.44375	46.72244	40.91174
	46.39559	48.76413	43.82359	37.56932	39.09196	38.78462		53.32158	52.68466	49.34315	41.98798	46.9396	39.57378
	48.22491	49.63453	46.36679	39.63803	40.64371	39.61276		52.75429	52.7075	49.71774	41.14344	46.95443	38.66577
	52.41224	52.04473	49.86035	43.15615	44.06648	40.26771		53.10313	52.72096	51.30758	42.02926	47.41218	38.3893
	55.79477	55.55344	52.54756	44.77965	46.98387	40.76194		53.93799	52.65092	51.84954	41.74231	46.59722	38.89637
	57.21645	57.15111	55.29141	45.34909	47.63243	41.72854		51.45136	52.01921	49.21797	40.51432	44.50649	38.39326
	54.90346	58.18596	51.38712	44.78626	46.49021	41.31951		52.08136	50.88436	48.21841	39.46127	45.22024	38.03962
	51.43102	53.6871	46.95272	40.68123	43.57586	39.76278		53.25857	51.04195	49.12746	40.02203	46.1674	38.43351
	48.19216	50.11947	44.42295	38.01178	39.96918	38.56833		53.51297	51.98065	49.74541	40.90984	46.42989	39.51887
	46.37913	48.78767	43.91873	37.63414	39.0236	38.72627		53.30066	52.6119	49.34362	41.9824	46.91811	39.82704
	47.83008	49.65223	45.52125	39.24832	40.92915	40.07175		52.01222	54.56998	50.44907	42.90317	47.38722	40.20735
	52.23254	53.276	48.64824	42.20814	43.97718	42.00132		51.1219	56.12247	51.31293	43.1736	47.1682	40.52621
56.47289	56.37042	53.07568	44.65567	47.07692	42.84876	51.25108	53.95256	50.51118	42.08515	45.82116	39.10721		

E Caucasian Male													
A full extension	39.5344	38.51597	39.63667	36.94223	40.10488	35.99091	135 flexion	41.7672	45.2195	41.48009	40.25611	44.71258	41.28424
	42.0357	42.31074	41.69442	39.08518	41.82686	38.84531		41.9423	44.7630	40.83196	39.33188	43.68574	39.82689
	44.8745	50.76113	44.83821	42.70616	45.38401	44.06344		44.0943	46.4421	42.27802	39.94994	43.72083	40.10458
	47.6152	56.72402	46.88902	44.03996	48.42455	46.79485		46.2686	50.4199	45.08308	41.27156	44.62379	41.58244
	47.9564	55.85816	47.56637	43.01049	48.41386	45.80989		46.2853	54.2066	47.70298	42.52852	46.25174	43.72448
	44.5153	50.94401	46.96325	40.66919	44.70258	41.62099		44.2990	52.7653	46.86978	42.59347	48.78007	45.60104
	40.1695	47.45579	44.50328	38.37362	41.86313	38.32463		43.1794	48.8314	43.15786	42.35096	50.25171	46.88724
	39.1072	42.25331	42.54187	37.30577	41.88768	37.66655		43.5082	46.4508	42.18578	43.03121	48.39612	45.6986
	39.7612	36.52357	34.71437	36.84742	37.2055	34.55409		38.1132	44.4598	40.681	38.28198	41.66503	34.6384
	35.5504	33.35183	29.10453	33.98474	30.72617	28.87665		28.7114	36.5418	33.73764	31.99849	31.64296	28.84878
	36.5870	37.76305	28.51875	33.60547	28.16816	27.48594		27.7933	35.5290	31.68911	29.49681	27.37864	28.46059
	44.1512	46.90337	37.27696	36.92881	35.75124	34.63895		31.4310	42.7473	34.76318	35.12691	30.80818	32.12459
	48.0511	55.40252	46.42461	42.01157	46.90896	45.00675		39.9503	52.6480	43.89837	41.2953	42.89906	39.45315
	45.8797	55.11399	49.03477	45.46193	49.59738	47.20212		50.2350	54.6292	50.90082	44.86318	49.59391	47.5977
	41.6808	47.31138	46.32815	44.87801	45.63272	43.18126		49.8495	51.0546	49.11483	45.74171	49.13138	49.27909
39.2149	40.35225	41.45759	39.41217	41.47598	37.49935	44.9798	47.5986	44.38614	43.38149	46.71964	45.35858		
90 flexion	49.20649	53.87124	53.39456	49.62808	51.42327	49.34068	A full flexion	59.83099	55.76831	62.32987	49.93396	59.36215	52.03317
	46.2515	52.04194	51.64041	45.63345	47.0368	46.71829		57.05368	56.05615	59.19729	47.05004	56.57703	54.06757
	44.59705	49.94679	49.36677	42.17619	42.78467	42.21593		54.48353	57.53144	55.32523	46.2765	53.68752	54.04615
	44.79341	47.92618	46.54386	39.7655	39.8852	39.7457		53.94217	57.88809	52.59223	47.72857	51.31247	50.19135
	46.17044	46.78026	44.61423	39.75053	39.08263	38.33088		54.98401	54.40637	50.43254	49.05273	49.89987	44.69424
	47.72587	47.81094	44.53978	41.7131	40.58913	38.45394		56.79265	50.8178	48.64965	49.31727	49.79626	42.27685
	49.58271	50.36903	47.01931	44.05096	44.03031	41.33139		59.11646	49.75547	50.18325	50.64171	55.1686	44.06401
	50.99387	54.13756	51.75414	46.91355	50.43996	47.26881		63.59399	53.67978	57.94856	50.90049	61.34478	49.78349
	48.97347	53.26411	53.20081	50.24798	51.14158	48.58751		58.98093	55.92649	61.03531	50.6428	56.41265	51.9004
	43.1899	52.26088	46.61598	43.12961	42.89808	38.64626		52.28504	57.05395	53.2665	47.51471	49.36282	49.05186
	40.0741	45.53528	42.52389	37.38458	36.72704	33.73598		42.2986	53.76403	44.52221	42.97631	38.91832	44.55571
	41.73499	42.49888	41.57915	35.62901	35.26787	33.16103		44.01531	48.75117	44.09621	39.65856	38.32091	39.39194
	45.50119	45.06135	43.36043	37.61217	37.3499	35.91703		52.67383	53.79838	50.09922	44.11865	45.95722	44.58875
	48.77995	49.83274	48.30611	43.20572	42.25678	41.57562		58.68199	58.65338	53.14238	53.10966	53.97744	49.2505
	51.15774	52.32238	54.83781	49.57589	48.19003	47.24327		61.40422	61.01239	57.03701	57.53385	59.66239	50.35308
51.78624	54.08561	55.72969	51.76078	52.43578	49.65449	61.56411	59.11377	60.82787	54.32263	60.86115	50.70091		

LAM Caucasian Male													
A full extension	37.8781	40.72224	42.83606	35.22039	38.9198	33.74513	135 flexion	38.9129	41.4836	42.13198	36.31391	41.82	35.83179
	37.7071	42.75449	41.95675	37.24237	40.38585	34.67853		39.3896	42.7491	42.09171	37.53739	42.44736	36.83768
	40.0046	46.75544	42.29086	41.49753	44.29368	38.62419		41.5521	45.7414	43.26756	40.32537	43.89083	38.67551
	44.6009	50.66429	43.69954	44.67068	49.48196	43.76737		44.1886	48.9556	45.08173	43.5293	46.21895	41.06372
	45.7795	52.59487	45.38515	44.20109	50.60663	45.8833		45.4484	51.6554	46.0617	45.37319	48.59405	42.82076
	43.3018	52.23966	47.86684	42.71413	47.79195	44.12836		45.4918	50.4492	45.38842	46.31682	48.21984	43.53494
	40.3474	49.39514	46.69745	38.24462	42.31005	39.31948		44.5447	47.5241	44.89984	44.11569	45.47087	43.02661
	38.1833	43.4153	44.33034	35.96566	40.21935	35.52704		41.2471	44.3245	43.5825	38.80268	43.64022	38.04944
	37.9353	40.53539	42.94883	35.09337	38.23218	33.70985		38.9092	41.4639	42.03487	36.23627	41.28067	35.83189
	39.1336	40.64178	43.7863	34.20928	33.6761	34.14606		39.5558	42.5572	41.46441	36.57517	38.61436	37.38914
	40.9238	44.01793	45.44096	35.69907	33.04187	37.52225		41.8264	45.9784	42.66702	38.56058	38.402	40.63572
	43.2873	50.13363	46.50228	40.95761	39.08605	42.59194		44.9134	49.8726	44.43143	42.36767	42.23497	43.33184
	45.8369	52.73435	45.93098	44.24002	48.98221	45.76899		45.4370	51.7054	45.9754	45.41008	47.38365	42.74068
	44.6514	50.14037	46.16906	43.4273	51.59856	45.11492		44.6352	49.9031	46.31858	44.88848	50.78095	40.92531
	41.3096	45.22539	46.16022	39.98358	47.0572	40.67913		42.7827	46.0742	45.33396	41.37987	47.77568	38.35773
39.1263	41.55918	44.37598	36.22982	41.33462	35.84749	40.3198	42.8193	43.55146	37.48682	43.49145	36.29447		
90 flexion	40.13201	41.77282	41.47203	35.65565	42.97591	37.25221	A full flexion	40.43116	40.88061	40.5157	36.04359	37.50465	36.16532
	39.87626	41.90774	42.12534	35.28228	42.48184	37.08672		40.23421	42.65053	40.22894	36.76382	40.20643	36.4179
	40.65103	44.50366	44.67474	36.89804	42.52719	38.09269		41.21478	45.31212	42.06247	41.21807	45.52674	39.30763
	42.4198	47.91064	46.64827	40.49111	43.82722	40.65384		43.43072	48.53974	45.57562	46.22593	49.6783	42.85917
	44.53874	50.23227	47.53774	45.04829	46.18167	43.52233		45.17278	51.22256	48.78636	47.10803	50.03268	45.88922
	46.73219	50.77041	47.49011	46.04272	47.74716	44.47642		47.66681	51.84905	50.20005	44.30068	48.23379	47.421
	47.18477	47.95191	44.97017	43.03087	47.48456	44.1804		47.48173	49.47722	48.17894	40.50049	44.02066	44.33677
	42.33718	43.68689	42.62736	37.98914	45.53003	40.4466		42.68329	43.25853	42.92225	37.36094	39.46597	38.87645
	40.09389	42.01681	41.40955	35.84053	41.91311	34.27483		40.44831	40.76443	40.86466	36.22423	37.35685	36.13019
	40.50203	43.44096	40.96438	37.39621	37.15886	31.97052		42.34665	43.45143	42.98645	37.62149	40.58417	36.80616
	42.53773	46.5612	42.63253	41.46163	35.09188	33.44936		46.0131	47.83827	46.07094	41.18542	46.71425	40.15226
	44.25342	49.54214	45.33572	44.86132	37.55363	37.97692		45.62565	50.64327	47.73035	45.28939	50.08392	44.20945
	44.8676	50.34265	47.47406	45.65173	43.99315	43.48083		45.50486	51.27199	48.86301	47.16885	49.91432	46.22933
	44.23892	48.82843	47.47203	43.78482	49.55497	44.13638		44.70307	47.70871	50.69589	46.76411	46.46557	43.91713
	42.70522	46.24227	45.51022	40.49557	49.15087	42.8656		42.9217	42.89369	49.84538	43.4927	41.81512	41.03741
41.16551	44.0966	43.00975	37.56403	44.94446	39.44478	41.38993	40.73138	43.94679	38.54527	38.36695	38.20207		

LAF Caucasian Male													
A full extension	35.9976	36.34907	39.89802	34.69664	39.30853	32.22676	135 flexion	35.3759	34.6456	40.35026	36.11123	40.87161	32.30363
	36.2016	37.13039	38.88656	36.47627	40.52247	33.53557		35.8305	35.5121	39.81263	37.57449	41.31163	32.88838
	36.7793	38.74829	38.72606	41.11804	43.32801	37.0273		36.9071	38.6862	40.14194	39.84399	42.51951	34.54186
	37.3882	40.86219	39.58898	43.96599	46.4466	40.53798		37.7988	41.7582	40.49335	42.13744	44.07354	36.99233
	38.1278	43.29315	41.203	43.57855	48.64081	41.35358		38.4291	42.4963	40.7068	43.95662	44.9277	39.24201
	39.2956	45.07682	42.91023	41.66944	47.70422	39.18456		39.1875	41.8414	41.74828	43.66913	45.34896	39.98243
	38.5415	43.22403	44.38198	39.14772	43.81961	35.92178		39.4509	39.5691	42.37	41.10217	44.75147	37.828
	36.5441	38.74375	42.16638	36.11814	40.35601	33.32917		37.3697	36.2426	41.63294	37.85026	42.2785	33.6882
	35.9798	36.33636	39.97674	34.67695	39.30855	32.18369		35.2137	34.5600	40.33558	36.16117	40.86803	32.24496
	37.0663	37.35154	41.23433	35.35641	40.33198	32.19064		36.3227	37.0503	39.73815	37.14504	42.39727	33.95445
	38.5018	39.40038	41.91681	38.81872	43.09853	34.51462		38.5024	40.6957	40.09299	39.70737	44.85354	36.88087
	38.6326	42.69762	41.4298	42.64279	46.67411	38.93745		39.2359	42.6615	40.43822	42.85901	45.72625	39.30915
	38.2255	43.70692	41.42382	43.75658	48.69392	41.33443		38.3408	42.4661	40.6944	43.98282	44.85834	39.42521
	38.3986	42.39092	41.77863	42.36329	46.71944	41.29094		37.5444	41.3881	41.97618	42.17534	43.71819	38.81789
	37.6829	39.34145	41.67696	38.99533	43.47796	38.4134		36.9124	38.7726	42.61624	39.26272	42.49927	36.20114
36.5585	37.05865	40.92397	35.83623	40.53677	33.87279	35.9125	36.0599	41.60537	36.58476	41.40685	33.33631		
90 flexion	33.70992	35.84533	37.40458	33.98394	41.14494	32.19333	A full flexion	35.11908	36.39768	37.65637	35.54953	36.37706	33.22246
	34.16854	37.11808	39.1251	34.59688	40.03941	33.23559		35.45618	36.552	37.91624	36.86513	36.55252	35.06271
	36.15822	39.20618	41.26007	36.26765	41.05612	36.23258		36.75914	38.97889	39.46556	40.45051	38.70475	37.65661
	38.60205	41.48836	42.62344	39.03265	43.46221	38.77228		37.84539	41.96031	41.58173	43.45701	41.62905	40.31897
	39.81011	42.99591	43.18862	42.45265	45.76218	40.57175		39.32066	43.62178	43.0008	43.69146	44.0647	40.55936
	39.83815	43.24109	42.24131	42.39222	47.54624	40.64236		40.62736	43.28262	42.88387	42.6934	45.33228	40.59198
	38.34259	41.09098	40.47245	38.28673	47.35467	38.16404		40.21475	40.81623	40.91046	40.36769	43.58623	38.02022
	35.62442	37.63106	38.17737	34.52801	44.49355	34.70096		36.21165	38.10614	38.58784	36.256	39.09428	34.62637
	33.50465	35.85349	37.3456	33.85621	38.94579	31.56288		34.99091	36.63302	37.68284	35.54984	36.24699	33.42923
	33.57341	37.24788	39.27756	35.88941	35.01158	31.80464		36.75595	38.52821	38.58005	36.48457	39.26474	34.69707
	35.79033	41.28664	41.38386	39.35643	35.89042	34.39844		38.88227	42.80644	40.4544	39.36289	44.12047	37.8054
	38.60541	43.37035	42.73309	42.12682	41.29152	37.56804		40.31447	43.9308	42.23537	42.14094	44.91364	40.36028
	39.8238	42.96028	43.19139	42.74543	45.91695	40.51401		39.23731	43.63095	43.0097	43.74046	44.30464	40.42607
	39.38573	41.32707	43.00606	41.68421	46.19352	40.68494		38.47024	42.48665	41.65024	42.7665	43.58271	38.09248
	37.42759	38.57251	41.31663	38.06293	44.77707	37.26779		38.09923	40.40113	40.01427	39.85878	40.81942	35.07178
35.02816	36.38745	38.52525	35.03432	43.06086	33.5466	36.07785	38.47358	38.66328	36.84322	37.95824	33.02422		

APPENDIX E: Distances between points along profiles and bones for the participants for the review of the new FDM

		mm									
		full flexion	135	90	full flexion			full flexion	135	90	full flexion
Participant 1		52.482	52.5422	50.0099	50.8046	Participant 2		73.407	78.6166	74.7655	77.4274
		47.5544	49.197	47.8268	49.3244			67.6127	70.8345	70.9489	73.8037
		46.4136	48.0144	47.2021	48.9445			65.3752	68.535	69.6074	73.0561
		44.4102	45.5834	46.0698	48.2531			60.9083	64.3754	66.7373	71.6945
		43.274	44.3775	45.5349	47.8635			58.7593	62.4189	65.2039	70.7324
		40.2343	42.0059	44.3528	46.7764			54.4682	58.5235	61.9555	67.8149
		38.3533	40.8304	43.6276	46.0102			52.314	56.5198	60.2135	65.8428
		34.2668	38.3153	41.7459	44.043			47.9439	52.2511	56.3179	60.9339
		30.4955	35.4063	39.0884	41.4371			43.2696	47.4065	51.438	54.7621
		27.7633	31.734	35.4781	37.9127			38.517	41.5708	45.0946	47.3596
		26.8616	29.7152	33.2356	35.512			36.1457	38.1778	41.2122	43.133
		26.0424	27.7383	30.706	32.589			33.3395	34.3632	36.8321	38.4591
		24.8498	25.8326	27.8754	28.9825			29.5753	30.2169	32.0392	33.2043
		21.8235	23.0731	23.3493	21.9429			23.3825	24.5432	24.8065	22.8668
		21.5047	22.6495	22.5611	20.5101			22.6563	23.5979	23.3089	20.5881
		21.2135	22.3363	22.2566	20.0121			22.0124	22.797	22.2487	19.5567
		20.9436	22.1312	22.3485	20.2382			21.4101	22.1	21.5769	19.4942
		20.697	21.9798	22.7386	21.1045			20.863	21.4796	21.1896	20.3205
		20.4733	21.913	23.2681	22.5501			20.3815	20.9268	21.072	22.1656
		20.269	21.9085	23.7927	24.2239			19.9475	20.4563	21.2528	25.1146
		20.0948	21.9839	24.2745	25.5451			19.5682	20.1394	21.663	28.8741
		19.9377	22.1331	24.6728	26.0869			19.2412	19.9575	22.1642	32.129
		19.3755	22.8192	25.6667	26.9122			17.6448	20.6751	23.5559	35.2851
		19.8642	22.5836	25.7417	27.1156			17.8965	21.9011	24.3235	36.3152
		20.1797	22.6035	25.8259	27.4642			18.7361	23.1501	24.959	37.4769
		20.7093	22.8884	25.9483	27.9381			19.6468	24.2409	25.5697	38.6948
	21.8744	23.4814	25.9652	29.0704		21.4165	26.0527	27.39	41.5977		
	22.3712	23.7793	26.0067	29.6078		22.4455	27.0161	28.5126	43.2369		
	23.3468	24.5974	26.4502	30.4559		24.7758	28.9618	30.5168	45.9832		
	23.702	25.0382	26.6998	30.7521		25.9456	29.8012	31.1879	46.8895		
	23.7416	24.5701	25.2605	30.0296		29.0308	31.2648	30.3599	46.2563		
	23.2469	23.5074	23.9477	28.5724		28.8561	30.5463	29.562	43.8517		
	22.0782	21.537	21.4849	26.0084		27.6664	28.6318	27.713	39.6076		
Participant 3		48.2401	50.572	49.13	50.4686	Participant 4		51.1301	48.7047	48.9334	48.6951
		44.1825	46.9843	46.4728	48.8337			48.5615	46.7754	48.2884	48.4796
		43.2118	45.7368	45.6735	48.2566			47.3186	46.0142	47.873	48.3971
		41.3349	43.0327	44.0838	46.9858			44.2373	44.3526	46.6939	48.0201
		40.1981	41.6393	43.2491	46.269			42.4836	43.4063	45.9201	47.6511
		37.1361	38.8753	41.3959	44.516			38.6091	41.1853	44.0039	46.404
		35.2301	37.5246	40.3417	43.4087			36.4789	39.8868	42.8683	45.4829
		31.0511	34.7626	37.8966	40.6661			31.9133	36.8639	40.253	43.0381
		27.2511	31.7545	34.9315	37.1732			27.4978	33.3349	37.1668	39.7539
		24.5064	28.1963	31.2516	33.0824			23.4961	29.4308	33.5654	35.6976
		23.5683	26.2892	29.0596	30.7158			21.5807	27.3897	31.4558	33.3923
		22.778	24.419	26.6432	27.9825			19.6493	25.3217	29.0178	30.8515
		21.596	22.6248	23.9538	24.6438			16.9285	23.12	26.1167	27.9009
		18.7913	20.4451	19.9562	18.7303			12.7126	19.35	21.1263	20.4118
		18.591	20.2453	19.4493	17.9796			12.5392	18.6869	20.1418	17.8672
	18.4051	20.1388	19.357	18.01		12.3827	18.1537	19.6232	16.3275		
	18.2345	20.1337	19.6469	18.6638		12.2405	17.7099	19.4286	15.6967		

		mm								
		full flexion	135	90	full flexion		full flexion	135	90	full flexion
		18.0799	20.1791	20.3211	20.0137		12.1165	17.3613	19.3302	15.7993
		17.9379	20.302	21.3473	22.2067		12.007	17.1344	19.0954	16.5283
		17.8076	20.4738	22.633	25.1561		11.9087	16.9841	18.7666	17.7357
		17.6971	20.7066	24.0205	28.2645		11.821	16.9393	18.5437	19.0607
		17.5968	20.9931	25.2227	30.3305		11.7492	17.0024	18.6577	20.4621
		17.1213	22.2301	27.332	32.1219		10.8458	17.7704	20.1113	22.0603
		17.4614	22.2599	27.6372	32.5517		10.6975	17.8976	20.6416	21.6036
		17.7239	22.4963	27.7666	33.0054		11.1558	17.7705	20.889	21.4443
		18.2879	22.8972	27.8574	33.5181		12.0309	17.7756	21.0404	21.8074
		19.5444	23.5636	27.8654	34.5806		13.8669	18.318	21.4567	23.2984
		20.0398	23.8789	27.966	35.0897		14.6824	18.7207	21.7311	24.0018
		20.9188	24.7582	28.6349	35.8643		16.161	19.4823	22.2572	24.8924
		21.2414	25.2619	29.018	36.0325		16.9035	19.8027	22.4183	25.1154
		21.4865	25.1909	28.1967	33.9646		19.4759	20.3623	21.4792	24.7425
		21.0757	24.2432	26.9502	32.0464		19.4542	19.7909	20.6328	24.1559
		20.1154	22.2295	24.2157	28.6663		18.9638	18.7482	19.561	23.1193
		42.982	44.4233	46.3561	47.5419		59.8045	60.0595	59.9924	61.8292
		41.237	41.7287	44.2933	46.7125		56.1364	55.0816	57.2665	59.8441
		40.3846	40.7482	43.459	46.1234		54.4944	53.5202	56.1806	59.1894
		38.0015	38.3317	41.3425	44.3982		50.7895	50.3335	53.5632	57.5632
		36.498	36.9252	40.0065	43.3184		48.8354	48.6615	52.0014	56.4623
		32.9176	33.8484	36.8813	40.7058		44.7365	45.1103	48.4864	53.4937
		30.8374	32.226	35.167	39.1155		42.5788	43.2276	46.5864	51.5935
		26.2772	28.8609	31.5794	35.1916		38.0555	39.2426	42.545	46.8803
		22.0651	25.3559	28.0121	30.2592		33.4915	34.9153	38.1563	40.9611
		18.5545	21.8499	24.3555	25.2377		29.1022	30.2335	33.151	34.4998
		16.9773	20.1141	22.3824	23.0497		26.9339	27.6995	30.2721	31.3297
		15.5578	18.3767	20.2393	20.8894		24.5776	24.9396	27.0681	28.0529
		13.4807	16.5881	17.7442	18.4129		21.3352	21.947	23.4543	24.4069
		10.2036	14.4938	14.1564	13.6706		16.2548	18.0101	18.0949	17.0819
		10.214	14.4132	13.8773	12.9797		15.8742	17.5068	17.2416	15.5408
		10.2185	14.4179	13.917	12.9216		15.5356	17.1178	16.7443	14.913
		10.228	14.5026	14.2697	13.4883		15.2214	16.8151	16.5784	15.0941
		10.2428	14.6627	14.9664	14.8776		14.9397	16.5963	16.7059	16.165
		10.2544	14.9196	16.0702	17.4492		14.692	16.4661	17.168	18.4148
		10.2647	15.2184	17.6799	21.5696		14.4692	16.3973	18.0817	22.1814
		10.2724	15.5707	19.6653	26.7698		14.2729	16.4323	19.3674	27.1258
		10.2824	15.9749	21.6387	31.2152		14.1068	16.5626	20.7559	31.5549
		9.6956	17.9418	25.4258	34.6566		12.9058	18.0686	23.7387	35.2673
		9.502	18.5033	26.3153	34.8547		12.8689	19.1052	24.724	35.7952
		9.7934	18.8517	26.5973	35.039		13.4877	19.9243	25.2279	36.3828
		10.5982	19.1616	26.6522	35.4915		14.4018	20.5915	25.5565	37.2012
		12.3487	19.8355	26.871	36.6619		16.2603	21.8379	26.6527	39.2897
		13.0314	20.2231	27.1718	37.2156		17.1829	22.538	27.426	40.41
		14.1073	21.0942	28.1168	37.8605		19.0333	23.9457	28.9717	42.0875
		14.6254	21.5727	28.5834	37.7969		19.9721	24.5936	29.5551	42.4566
		16.588	22.657	28.8544	34.3374		22.9297	26.1873	29.5462	40.1288
		16.5459	22.1919	28.0068	32.5215		22.882	25.7309	28.8398	38.0887
		16.2066	20.7938	25.9236	29.3128		22.1653	24.2636	27.1002	34.4834

	mm								
	full flexion	135	90	full flexion		full flexion	135	90	full flexion
Participant 1	52.8392	52.6433	54.7094	55.3305	Participant 2	59.1448	59.622	60.3997	61.9913
	47.6657	48.7101	50.9986	53.384		55.4119	56.9893	58.2849	60.8431
	45.4286	47.6968	50.2315	53.2899		53.9764	55.5717	57.0758	59.9266
	40.307	45.4157	48.8993	53.2209		50.0436	52.0467	54.1233	57.6721
	37.6874	44.0663	48.2102	52.9707		47.1212	50.0174	52.4067	56.3384
	32.7421	40.939	46.4847	51.5767		39.5492	45.5383	48.5449	53.1689
	30.4022	39.1325	45.3235	50.4568		35.7014	43.1329	46.4341	51.3099
	25.8981	34.9764	42.2239	47.3967		30.0453	38.1476	41.9542	47.063
	21.7611	30.17	38.2133	43.4122		26.7643	33.1123	37.2401	42.6304
	18.686	25.1978	33.5165	39.2227		24.0075	28.2447	32.4477	38.6224
	17.6862	22.8304	30.9467	37.2799		22.3304	25.9463	30.0721	36.5268
	16.9	20.6614	28.2625	35.4295		20.9134	23.7459	27.6739	34.0862
	15.9581	18.7284	25.4545	33.5329		20.4098	21.7835	25.0645	30.9991
	15.1828	17.1188	21.7864	29.5583		19.364	20.1309	21.2348	24.5677
	15.194	17.0805	21.5704	28.7513		19.309	20.0013	20.8283	23.2474
	15.212	17.1087	21.9104	28.3375		19.2646	19.9492	20.823	22.7537
	15.2369	17.2147	22.7903	28.3862		19.2332	19.967	21.1635	22.8676
	15.2688	17.4088	24.1353	28.9766		19.2134	20.0543	21.7901	23.583
	15.3149	17.6768	25.759	30.2873		19.204	20.2129	22.618	24.9389
	15.3702	18.0186	27.3351	32.2919		19.2048	20.4453	23.5104	27.0811
	15.4325	18.4362	28.769	33.6238		19.214	20.7547	24.3683	29.929
	15.5019	18.9489	30.0841	33.339		19.2284	21.1449	25.2609	31.8267
	17.8979	22.5999	32.3977	32.2697		19.5919	23.4926	28.1488	32.8896
	19.483	23.499	32.5027	33.0991		20.0337	24.369	28.9593	33.5711
	20.0978	23.3884	32.2864	34.3378		20.4021	24.8542	29.4453	34.5027
	20.3028	23.0829	32.1053	35.6739		20.9716	25.0308	29.7019	35.2765
	20.8305	22.8743	32.8685	38.2896		23.1575	25.4028	29.9857	36.6495
	21.2754	23.2292	33.4042	39.4441		24.267	25.9124	30.2527	37.3189
	22.4573	24.4968	33.9946	40.5336		26.0925	27.8704	31.0854	38.5614
	23.1485	25.2083	34.0724	40.2693		26.8247	28.9669	31.617	39.0271
25.21	26.7457	32.5789	35.7506	28.3854	29.7729	33.5637	37.6021		
24.746	25.6215	30.1842	33.6051	27.4581	28.0186	32.2452	34.5286		
23.0603	22.8936	25.6716	29.8517	24.4734	24.9554	28.1037	29.2426		
Participant 3	57.8514	58.9411	57.7132	58.7436	Participant 4	48.5355	45.235	45.6991	47.2142
	54.5917	54.3117	54.2474	55.5488		48.4602	46.4113	46.7633	49.8824
	53.1293	52.8777	53.4228	54.7727		47.7671	46.4144	46.7952	50.3456
	48.9467	49.671	51.5275	53.6794		45.1428	45.5989	46.4626	50.5202
	46.0978	47.666	50.2327	53.0275		43.4171	44.728	46.0325	50.234
	39.285	42.8062	46.8552	50.6801		39.4947	42.3594	44.5368	48.8809
	35.771	40.0799	44.8244	48.8529		37.303	41.0389	43.4357	47.8239
	29.8487	34.4336	40.1435	43.9255		32.6332	37.9243	40.768	45.0107
	25.5074	29.3069	34.8311	38.0287		28.0961	33.5904	38.0803	41.5376
	22.2358	25.4776	29.6982	33.5235		24.1973	27.9977	35.1582	37.6424
	21.1825	23.616	27.6527	31.4946		23.2554	25.4143	33.2311	35.6202
	20.1143	21.5099	26.0978	29.0869		21.92	23.3101	30.7768	33.36
	18.2408	19.5039	24.7796	26.1508		17.5941	22.0203	27.8734	30.3852
	17.3969	18.454	21.9239	22.0543		13.7516	21.6721	23.6213	22.2591
	17.4228	18.5265	21.3879	22.1285		13.7171	21.7831	23.1539	20.1561
17.4507	18.6885	21.2254	22.9653	13.6892	21.9429	23.0165	19.0859		
17.491	18.9469	21.464	24.3146	13.67	22.1304	23.139	18.8187		

	17.5415	19.2933	22.1008	25.9909	13.6584	22.3199	23.4455	19.2625
	17.5943	19.7063	23.091	28.1918	13.653	22.4819	23.821	20.4432
	17.6499	20.1907	24.3391	31.1753	13.6535	22.5564	24.0834	22.3396
	17.7105	20.7412	25.7573	34.5317	13.6583	22.5961	24.0346	24.6942
	17.7766	21.3405	27.1889	36.783	13.6713	22.643	23.8128	26.1891
	19.4387	23.3989	29.1894	38.0369	15.1266	22.429	23.2942	26.6735
	18.9864	23.3619	29.4352	38.1003	14.8498	21.5086	22.814	26.3141
	17.9751	23.3384	29.6314	38.0719	14.8003	20.9102	22.6282	26.3625
	17.9111	23.3407	29.6785	38.0603	15.5218	21.0372	22.8523	26.8187
	18.9701	23.5207	29.5313	38.1485	16.6028	22.1805	24.3949	29.347
	19.738	23.8741	29.4093	38.1784	17.3444	22.8062	25.2755	30.7706
	21.0957	25.1344	29.1986	38.0405	19.1076	23.8996	26.6592	32.7928
	21.6411	25.834	29.103	37.8178	19.9836	24.3662	27.1808	33.3621
	22.8904	26.1658	28.1317	34.6905	22.5462	26.2814	28.3863	33.3203
	22.4233	24.8774	26.8638	32.6058	22.9163	26.6954	28.0826	32.4565
	21.1278	22.2539	23.8741	29.0985	23.3087	26.046	26.8823	30.3458
Participant 5	47.0014	48.4732	48.114	49.841				
	47.0108	48.6462	49.1553	50.7471				
	46.4818	48.1538	48.7355	50.4602				
	44.5058	46.4766	46.9289	49.1394				
	43.0275	45.3152	45.7349	48.159				
	39.1643	42.4423	43.1402	45.6323				
	37.0519	40.7779	41.7399	44.0938				
	33.2254	37.103	38.5687	40.5422				
	29.993	33.1165	34.6785	36.4199				
	26.5891	28.3982	29.7688	31.7694				
	24.8978	25.6819	26.8678	29.26				
	23.0789	22.9927	23.6342	26.6089				
	19.8957	20.466	20.0814	23.4688				
	14.9656	16.894	15.162	16.7837				
	14.8105	16.4379	14.5699	15.5157				
	14.6747	16.0723	14.245	14.9988				
	14.5468	15.7999	14.1862	15.1024				
	14.4271	15.6145	14.3355	15.8572				
	14.3261	15.5145	14.6876	17.3082				
	14.242	15.5006	15.2578	19.6129				
	14.1666	15.5741	16.035	22.9768				
	14.0999	15.7385	17.0291	27.2154				
	13.9408	17.0171	20.3301	32.0056				
	15.0655	17.4665	20.893	31.8878				
	17.2048	18.0832	21.4402	31.5835				
	18.9749	19.2191	22.2208	31.6949				
	21.4244	21.9821	24.529	34.0953				
	22.5537	23.0662	25.867	35.6191				
25.0011	24.7303	28.4225	37.5206					
26.2213	25.4535	29.5133	37.9096					
29.6346	28.3261	31.7084	36.5804					
29.6593	28.37	30.9374	34.8838					
28.3519	26.9027	29.2632	31.5532					

Caucasian Female

		mm									
		full flexion	135	90	full flexion			full flexion	135	90	full flexion
Participant 1		81.3459	84.0558	86.5737	88.7123	Participant 2		73.2788	77.3717	78.9283	79.8842
		80.5806	82.329	84.8348	86.7868			71.6488	75.7882	77.505	78.7117
		79.6504	80.9705	83.5205	85.3095			70.5801	74.6379	76.4514	77.7519
		76.1813	76.7089	79.6438	81.7657			67.4147	71.1918	73.3966	75.1873
		73.7782	74.0134	77.2265	79.8031			65.3991	69.0092	71.4832	73.6548
		68.0931	68.1805	71.8924	75.5841			60.7369	64.1	67.1635	70.1409
		65.0265	65.2932	69.1288	73.2355			58.1893	61.5365	64.8571	68.1317
		59.0445	59.4995	63.4951	67.8606			52.9123	56.2312	59.9762	63.5323
		53.0243	53.3428	57.5931	61.2261			47.3477	50.5909	54.5877	57.948
		45.9799	46.1057	50.7347	52.895			41.2667	44.2116	48.2993	51.0509
		42.027	42.0968	46.5668	47.878			38.1432	40.7417	44.6431	46.9338
		38.0065	37.9235	41.7413	42.1459			35.0997	37.1749	40.5577	42.2506
		33.3995	33.5043	36.2302	35.3838			31.7654	33.559	35.9752	36.7786
		25.5239	25.5144	26.5615	21.8908			26.4788	27.8737	28.0465	25.4218
		24.8141	24.0546	24.1909	18.8789			25.9363	26.8557	26.1511	22.7252
		24.1392	22.7451	22.4686	17.3327			25.4324	25.9441	24.8648	21.4238
		23.5038	21.6305	21.1884	16.8046			24.9699	25.1598	24.0525	21.1612
		22.9411	20.6554	20.2881	17.104			24.5607	24.4762	23.6604	21.7867
		22.4134	19.8749	19.7065	18.1765			24.1821	23.9189	23.6188	23.3815
		21.9473	19.2771	19.4716	20.0682			23.8542	23.4817	23.8928	26.0907
	21.5245	18.8818	19.5935	22.978		23.5686	23.1749	24.4526	29.4279		
	21.1574	18.6558	20.1447	26.7661		23.3284	22.9774	25.3161	31.967		
	18.7365	19.2295	23.762	33.7271		21.6753	22.8177	28.6194	36.8512		
	19.0816	20.3132	25.9173	34.9725		20.541	22.9894	30.1159	37.9883		
	20.1236	21.0323	27.6259	35.9171		20.63	23.2867	31.2624	38.9609		
	21.3558	21.9346	29.0278	37.1548		21.7543	24.0189	32.2466	40.0803		
	24.5534	24.9638	31.6215	40.7232		24.5579	26.469	34.159	42.8368		
	26.3604	26.7633	32.871	42.5139		25.8846	27.8217	35.0976	44.1056		
	29.6847	30.3372	35.267	45.3441		28.3645	30.3511	36.7764	45.8215		
	31.085	31.8786	36.3676	46.3599		29.4287	31.3777	37.4426	46.2145		
	34.2413	34.3159	39.2849	47.3844		31.382	32.5806	37.9188	44.1992		
	33.6136	33.4292	38.4248	46.0751		30.6931	31.6141	36.5038	42.0517		
	31.3866	32.0882	35.6939	42.775		28.8642	29.9278	33.3328	37.841		
Participant 3		76.9548	79.6512	79.9251	78.2322	Participant 4		52.9211	54.0126	55.0037	57.122
		76.1459	79.5539	79.5711	78.6467			48.6642	50.2668	52.642	55.3822
		75.4382	78.8677	78.9923	78.5337			46.9356	48.9157	51.5211	54.4552
		73.5452	76.5985	77.3013	77.3988			43.0671	45.7956	48.4863	52.2535
		72.3356	75.0213	76.1637	76.4393			41.0058	44.0513	46.69	50.9752
		69.165	70.9684	73.147	73.7595			36.886	40.3382	43.0543	48.0611
		67.1462	68.5595	71.2393	72.1204			34.8509	38.4464	41.3839	46.3951
		62.085	63.2247	66.631	68.346			30.7936	34.6102	38.2151	42.6154
		55.9981	57.4844	61.0324	63.8398			26.7065	30.6426	34.6818	38.21
		49.8676	51.3569	54.7384	58.2917			22.651	26.3168	30.058	33.1354
		47.0328	48.0722	51.4308	54.9569			20.9263	24.0899	27.2825	30.2737
		44.2963	44.6999	48.0032	51.178			19.5647	21.9466	24.2048	27.0668
		41.5509	41.4459	44.2613	46.8689			18.2251	20.0348	20.8596	23.3222
		37.6578	37.8703	37.2559	36.4413			16.7916	17.3802	16.3799	16.5545
		37.0271	37.1961	35.2751	33.4039			16.6838	17.0478	16.0127	15.3645
	36.4679	36.573	33.9339	32.0334		16.5876	16.7907	16.087	14.8936		
	35.9803	35.9909	33.1391	31.9858		16.5055	16.6144	16.6029	15.0291		

	35.5444	35.4596	32.8488	33.0878		16.4389	16.5128	17.5091	15.7746
	35.1489	34.9546	33.019	35.7261		16.3834	16.5131	18.668	17.0753
	34.8208	34.4891	33.617	40.3727		16.3386	16.5912	19.8572	18.7962
	34.5602	34.0489	34.6552	45.1257		16.3082	16.7723	20.8584	20.9179
	34.3548	33.6239	36.129	45.601		16.2916	17.0525	21.5698	23.4117
	32.4218	31.0723	40.5163	49.0032		16.5034	18.9134	22.0805	24.8382
	26.806	29.5516	42.011	50.7678		17.0056	19.3735	21.668	24.5724
	24.5681	29.2194	42.9389	52.3604		17.5657	19.5385	21.5619	24.5503
	26.0925	29.92	43.5965	53.7663		18.0523	19.8321	21.9001	24.8293
	30.0565	32.2928	44.8238	55.9909		18.8397	20.7349	23.0233	26.1518
	31.3118	33.4149	45.4615	56.6476		19.2568	21.1905	23.5811	26.967
	33.4297	35.2609	46.4414	56.6281		20.3836	21.8735	24.3908	28.4587
	34.2869	35.9173	46.6519	55.8822		20.9748	22.0481	24.5864	29.02
	35.1078	36.0837	43.563	47.588		21.6427	21.4652	24.161	29.0731
	34.0308	34.8056	40.84	43.579		21.2329	20.8076	23.4043	27.7217
	32.1147	32.2888	36.0439	36.7823		20.3104	19.5601	21.7749	25.3543
Participant 5	61.7693	61.2164	62.1324	63.4193	Participant 6	50.9123	50.2373	50.3364	51.1251
	58.6889	58.3753	60.2424	62.1401		46.3642	46.9052	48.4081	50.2103
	57.2715	57.169	59.2296	61.3616		44.5481	45.7877	47.5565	49.7974
	53.8235	54.1738	56.4434	59.3212		40.5045	43.4435	45.3423	48.531
	51.8622	52.4153	54.7578	58.076		38.3651	42.158	44.036	47.6516
	47.6662	48.5148	51.1667	55.1434		34.1521	39.2206	41.3307	45.3686
	45.4707	46.4569	49.3861	53.4469		32.1102	37.5691	40.0388	43.9997
	40.927	42.1889	45.7712	49.5832		28.133	34.0385	37.4098	40.8941
	36.1721	37.7173	41.6604	45.0368		24.2152	30.3791	34.159	37.3933
	31.268	32.8425	36.5525	39.6849		20.3304	26.6557	29.898	33.527
	28.9896	30.2894	33.5865	36.6049		18.6938	24.8132	27.525	31.4097
	26.9583	27.7693	30.339	33.1382		17.4417	23.0995	25.0626	29.0687
	24.847	25.4305	26.7916	29.1093		16.2114	21.7793	22.4927	26.4003
	21.9486	22.2899	21.4833	21.1831		14.9652	21.054	19.3246	21.1984
	21.6509	21.8227	20.6566	19.4923		14.9012	21.0782	19.2424	20.1359
	21.3792	21.4295	20.3258	18.7675		14.8435	21.1379	19.5832	19.8063
	21.1362	21.1145	20.4596	18.8277		14.7949	21.2163	20.4018	20.1581
	20.9243	20.8723	21.008	19.6272		14.7589	21.3339	21.6547	21.2151
	20.7324	20.7206	21.8581	21.2078		14.7314	21.4881	23.2044	23.0755
	20.5697	20.6439	22.8421	23.5769		14.7099	21.6627	24.7889	25.7385
	20.4356	20.6586	23.8045	26.3155		14.6981	21.8714	26.1736	28.4402
	20.3293	20.7577	24.6738	28.4374		14.6967	22.1205	27.2167	29.6889
	19.7362	21.5861	26.1971	30.5909		15.0871	22.9945	27.7617	29.4676
	19.107	21.6468	26.3382	30.8493		16.1373	22.5053	26.9281	29.2687
	19.2373	21.7328	26.5548	31.2315		16.9509	22.2644	26.4155	29.3989
	20.0297	22.1477	27.0196	31.8078		17.3482	22.4424	26.4162	29.6644
	21.7733	23.4852	28.244	33.4472		17.8631	22.9586	26.9557	30.3531
	22.5621	24.1581	28.8562	34.2798		18.2123	23.0788	27.2496	30.7021
	24.2162	25.2494	29.7877	35.513		19.2615	22.9466	27.4498	31.106
	24.9836	25.6022	30.0349	35.813		19.833	22.7121	27.2691	31.0226
	26.0732	25.3442	29.2062	34.0946		20.5	21.1161	24.5118	27.7731
	25.5083	24.5389	28.0145	32.165		20.149	20.34	23.1172	25.4829
24.1994	23.0091	25.6346	28.7804	19.3089	18.6919	20.8545	21.9734		

Caucasian Male

		mm								
		full flexion	135	90	full flexion		full flexion	135	90	full flexion
Participant 1		71.6115	71.4019	72.2804	73.6692	Participant 2	63.639	58.7184	60.9513	62.5855
		69.6056	70.5202	71.7737	74.04		61.4818	59.3486	62.0125	63.7427
		68.3791	69.6217	71.133	73.5923		59.8767	59.0179	61.7412	63.6912
		65.0606	67.1005	69.0799	71.9673		56.0293	57.5803	60.2155	62.8595
		63.0069	65.511	67.6624	70.8202		53.8183	56.4512	59.132	62.0925
		58.1948	61.6776	64.0812	67.8343		48.8374	53.3614	56.3172	59.7917
		55.3976	59.3803	61.9002	66.0175		46.1204	51.4124	54.5066	58.2307
		48.8629	53.8469	56.8028	61.648		40.4935	46.6946	50.032	54.1391
		41.3415	46.6788	50.9296	56.2547		34.8883	40.9016	44.4875	48.679
		34.5017	39.2415	44.442	49.6406		29.2882	34.8688	38.0332	41.7954
		32.5044	36.4432	40.7423	45.7253		26.0743	32.3048	34.4339	37.8091
		31.3745	34.5593	36.6873	41.2674		22.4486	30.2485	30.5349	33.396
		29.2433	32.9454	32.3637	36.0719		19.2248	28.1841	26.3169	28.2918
		25.016	29.7434	26.4727	25.5554		17.5182	24.9287	20.2832	18.4445
		24.6853	29.1957	25.8113	23.157		17.4956	24.4396	19.4821	16.4967
		24.4002	28.7564	25.8306	21.8766		17.4849	24.0452	19.1813	15.58
		24.1574	28.3751	26.4136	21.5271		17.4806	23.7064	19.2849	15.5025
		23.9511	28.0646	27.5642	22.1695		17.4784	23.4305	19.7029	16.2758
		23.7821	27.8234	29.0363	23.9693		17.4827	23.2257	20.272	17.9534
		23.6594	27.6184	30.1018	26.6484		17.4964	23.0548	20.721	20.8453
		23.5937	27.5091	29.8028	28.4771		17.5113	22.955	21.1155	25.4839
		23.5664	27.4662	28.9117	29.5829		17.5357	22.8949	21.8869	30.7036
		23.9363	27.5312	28.5101	32.1314		18.081	22.6608	25.4452	36.0223
		24.5785	27.3396	28.8223	32.7912		18.5354	22.4885	26.448	36.3923
		25.812	27.6474	29.5311	33.6777		19.542	22.9487	26.8842	36.9434
		27.196	28.4236	30.5108	34.9317		20.6087	23.7658	27.2337	38.0126
		29.69	30.6042	32.6077	37.8046		22.4569	26.0939	28.9846	40.806
		30.7129	31.6949	33.4312	39.0591		23.3239	27.4757	30.0905	42.1709
	32.2161	33.3474	34.4731	40.6636	24.8526	30.1648	32.0702	44.2679		
	32.6971	33.8097	34.7254	40.9627	25.5542	31.2662	32.8393	44.8676		
	32.4205	32.735	33.3241	38.9396	28.0828	32.5541	33.737	43.9018		
	31.3967	31.1091	31.335	36.8853	28.4855	31.4713	32.5296	41.9803		
	29.3101	27.848	27.2779	32.7673	28.7048	29.2267	29.7158	37.5868		
Participant 3		52.527	49.9261	50.5814	53.3766	Participant 4	64.624	68.9726	68.4179	71.1942
		48.5493	47.4465	49.1261	53.403		61.4854	65.8986	66.1712	70.9751
		47.015	46.4272	48.51	53.3048		59.7504	64.5018	65.296	70.5469
		43.3915	44.0096	47.1554	52.6898		55.5582	61.1678	63.3124	69.1068
		41.2938	42.5971	46.4865	52.1456		53.1479	59.2612	62.1635	68.0776
		36.6718	39.4111	44.9934	50.5172		47.8166	55.0195	59.3866	65.353
		34.2495	37.6818	44.0678	49.3871		44.9334	52.6978	57.691	63.6565
		29.5289	34.0815	41.5855	46.4536		38.9051	47.6658	53.5728	59.584
		25.0868	30.6581	37.7823	42.5856		32.745	41.9335	48.2964	54.6145
		20.9035	27.21	32.589	38.0188		27.0355	35.8626	41.8527	48.8073
		19.2974	25.213	30.0885	35.6119		24.6803	33.0326	38.4542	45.566
		18.2204	23.0427	27.8629	33.1652		22.6165	30.4902	35.0804	42.0597
		18.1719	21.3442	25.8426	30.6322		20.8785	28.5339	31.7839	38.2843
		18.6741	21.1373	23.0165	26.3607		19.5209	26.6275	27.5361	31.2602
		18.7429	21.383	22.8208	25.9586		19.4803	26.4621	27.1774	29.8578
		18.8224	21.7208	23.019	26.1311		19.4566	26.3974	27.4119	29.3622
	18.9084	22.1552	23.6013	26.8834	19.4503	26.4225	28.1962	29.6638		

	18.9978	22.6471	24.4938	28.3499		19.4524	26.5298	29.6251	30.8319
	19.1021	23.147	25.783	30.7755		19.4757	26.6874	31.7432	33.2747
	19.22	23.6568	27.6752	34.1036		19.5194	26.9033	34.2112	36.6071
	19.3481	24.1359	30.0806	37.099		19.5893	27.1717	35.7358	37.6191
	19.4768	24.6065	32.3382	38.5396		19.6694	27.4935	36.1605	36.4135
	20.4498	25.9172	35.3957	38.1055		21.1827	28.475	36.1883	35.607
	20.5101	25.7356	35.0181	38.2199		22.5246	28.2693	35.9857	36.1951
	20.5269	25.9038	34.4371	38.9189		23.4702	28.8453	36.1582	37.1935
	20.7106	26.3476	34.2405	39.7829		24.1993	29.8313	36.8141	38.3166
	21.8767	27.2162	34.7123	41.3041		25.5539	31.3291	38.0176	40.1778
	22.6545	27.5325	35.0872	41.7476		26.1606	31.6273	38.3466	40.7058
	23.9522	27.9683	35.6842	41.8667		27.0809	31.5907	38.4928	40.872
	24.3363	28.0706	35.8674	41.6056		27.3678	31.3488	38.3563	40.607
	24.3372	27.7867	34.8844	38.0379		27.2514	29.4027	35.5069	37.1015
	23.3502	27.0903	33.2523	36.0544		26.4439	28.1526	33.32	35.0267
	21.279	24.9576	30.161	32.8995		24.9621	25.0721	29.1101	31.839
Participant 5	47.2388	50.1621	51.1699	52.5386	Participant 6	55.4132	57.9294	59.6682	62.3511
	43.467	47.684	49.5021	52.0713		53.9674	58.0743	60.4573	63.6346
	42.3345	46.5882	48.7825	51.7124		53.2413	57.6748	60.1891	63.7248
	39.5855	44.1383	47.2597	50.6469		51.254	56.0789	58.7702	63.1732
	37.9148	42.8077	46.4034	49.9647		49.936	54.84	57.8468	62.5072
	34.1029	39.9628	44.5393	48.2992		46.6099	51.4893	55.412	60.2911
	32.0764	38.3745	43.5281	47.3137		44.6607	49.4657	53.7589	58.6856
	28.1188	34.7256	41.1582	44.9963		40.3559	44.8943	49.4551	54.3483
	24.3698	30.6489	38.0362	42.1405		35.7448	39.775	43.7001	48.4651
	20.7364	26.907	34.1584	38.7624		30.9033	34.2163	36.5817	41.1531
	19.5741	25.5038	32.2765	36.8827		28.5555	31.3428	32.7347	37.0492
	19.1781	24.524	30.5717	34.8224		26.3385	28.525	28.725	32.6546
	19.7037	24.0778	29.0277	32.448		24.0078	25.7368	24.4973	27.7927
	20.0697	24.8624	26.7536	27.5367		21.3354	22.2671	18.5528	19.0732
	20.0854	25.1838	26.7249	26.7898		21.1447	21.8267	17.7336	17.5327
	20.1195	25.6152	27.2145	26.5423		20.9872	21.4698	17.3294	17.0129
	20.161	26.1297	28.1606	26.8768		20.8429	21.1827	17.288	17.3001
	20.2137	26.6773	29.3767	28.0702		20.7218	20.9736	17.5966	18.334
	20.2805	27.198	30.6438	30.1721		20.6086	20.849	18.3156	20.3226
	20.365	27.6604	31.771	32.6627		20.5184	20.7985	19.4699	23.7942
	20.4564	28.0706	32.684	34.1417		20.4289	20.8199	21.05	29.05
	20.5544	28.4545	33.401	33.9306		20.3673	20.8869	22.9254	34.6287
	20.3847	29.8944	33.3694	32.1876		18.4529	20.7922	28.2008	39.8811
	19.0225	29.7205	32.1183	32.2764		16.0376	20.613	29.5407	40.2453
	18.5563	28.989	31.5288	33.0752		16.2166	21.5966	29.8568	40.7676
	18.7572	28.6005	31.6049	34.0368		17.4922	22.8884	29.9872	41.7553
	20.4443	29.0597	32.4812	36.078		20.6139	25.2725	31.3246	44.0515
	21.5965	29.553	32.8487	36.8138		22.2937	26.3861	32.3244	45.1025
23.5762	30.2052	33.1819	37.2201	25.268	28.5898	34.2444	46.73		
24.2245	30.2414	33.2193	36.9297	26.5318	29.5709	35.0046	47.2192		
24.9319	28.8179	31.8678	32.7885	30.4849	31.2665	35.7831	46.2201		
24.0448	27.6094	29.7945	30.7168	31.0886	30.5365	34.764	44.3403		
21.7488	24.8202	26.1419	27.3117	30.8367	28.6789	32.2146	40.284		