Hendrik Schmidt

List of Publications by Year
in descending order

115 papers	5,140 citations	87888 38 h-index	98798 67 g-index
116 all docs	116 docs citations	116 times ranked	3116 citing authors

#	Article	IF	Citations
1	Analysis of the influence of disc degeneration on the mechanical behaviour of a lumbar motion segment using the finite element method. Journal of Biomechanics, 2006, 39, 2484-2490.	2.1	302
2	Application of a new calibration method for a three-dimensional finite element model of a human lumbar annulus fibrosus. Clinical Biomechanics, 2006, 21, 337-344.	1.2	292
3	Comparison of eight published static finite element models of the intact lumbar spine: Predictive power of models improves when combined together. Journal of Biomechanics, 2014, 47, 1757-1766.	2.1	291
4	Application of a calibration method provides more realistic results for a finite element model of a lumbar spinal segment. Clinical Biomechanics, 2007, 22, 377-384.	1.2	223
5	Intradiscal Pressure, Shear Strain, and Fiber Strain in the Intervertebral Disc Under Combined Loading. Spine, 2007, 32, 748-755.	2.0	212
6	Stepwise reduction of functional spinal structures increase range of motion and change lordosis angle. Journal of Biomechanics, 2007, 40, 271-280.	2.1	200
7	Estimation of loads on human lumbar spine: A review of in vivo and computational model studies. Journal of Biomechanics, 2016, 49, 833-845.	2.1	160
8	The risk of disc prolapses with complex loading in different degrees of disc degeneration â€“ A finite element analysis. Clinical Biomechanics, 2007, 22, 988-998.	1.2	153
9	The relation between the instantaneous center of rotation and facet joint forces â€“ A finite element analysis. Clinical Biomechanics, 2008, 23, 270-278.	1.2	127
10	Finite element modeling of soft tissues: Material models, tissue interaction and challenges. Clinical Biomechanics, 2014, 29, 363-372.	1.2	126
11	Effect of multilevel lumbar disc arthroplasty on spine kinematics and facet joint loads in flexion and extension: a finite element analysis. European Spine Journal, 2012, 21, 663-674.	2.2	121
12	Geometry strongly influences the response of numerical models of the lumbar spineâ€”A probabilistic finite element analysis. Journal of Biomechanics, 2012, 45, 1414-1423.	2.1	112
13	Response analysis of the lumbar spine during regular daily activitiesâ€”A finite element analysis. Journal of Biomechanics, 2010, 43, 1849-1856.	2.1	105
14	What have we learned from finite element model studies of lumbar intervertebral discs in the past four decades?. Journal of Biomechanics, 2013, 46, 2342-2355.	2.1	102
15	The relation between intervertebral disc bulging and annular fiber associated strains for simple and complex loading. Journal of Biomechanics, 2008, 41, 1086-1094.	2.1	84
16	Stepwise reduction of functional spinal structures increase vertebral translation and intradiscal pressure. Journal of Biomechanics, 2007, 40, 795-803.	2.1	80
17	Activities of Everyday Life with High Spinal Loads. PLoS ONE, 2014, 9, e98510.	2.5	76
18	Comparison of four methods to simulate swelling in poroelastic finite element models of intervertebral discs. Journal of the Mechanical Behavior of Biomedical Materials, 2011, 4, 1234-1241.	3.1	74

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19	Comparative evaluation of six quantitative lifting tools to estimate spine loads during static activities. Applied Ergonomics, 2015, 48, 22-32.	3.1	73
20	Biomechanical Evaluation of a New Total Posterior-Element Replacement System. Spine, 2006, 31, 2790-2796.	2.0	72
21	No consensus on causality of spine postures or physical exposure and low back pain: A systematic review of systematic reviews. Journal of Biomechanics, 2020, 102, 109312.	2.1	70
22	Preliminary Investigations on Intradiscal Pressures during Daily Activities: An In Vivo Study Using the Merino Sheep. PLoS ONE, 2013, 8, e69610.	2.5	63
23	Which axial and bending stiffnesses of posterior implants are required to design a flexible lumbar stabilization system?. Journal of Biomechanics, 2009, 42, 48-54.	2.1	60
24	Prospective Design Delineation and Subsequent In Vitro Evaluation of a New Posterior Dynamic Stabilization System. Spine, 2009, 34, 255-261.	2.0	60
25	The mechanical response of the lumbar spine to different combinations of disc degenerative changes investigated using randomized poroelastic finite element models. European Spine Journal, 2011, 20, 563-571.	2.2	60
26	Creep associated changes in intervertebral disc bulging obtained with a laser scanning device. Clinical Biomechanics, 2007, 22, 737-744.	1.2	58
27	Comparison of in vivo measured loads in knee, hip and spinal implants during level walking. Journal of Biomechanics, 2017, 51, 128-132.	2.1	57
28	The effect of different design concepts in lumbar total disc arthroplasty on the range of motion, facet joint forces and instantaneous center of rotation of a L4-5 segment. European Spine Journal, 2009, 18, 1695-1705.	2.2	55
29	Age-Related Loss of Lumbar Spinal Lordosis and Mobility â€“ A Study of 323 Asymptomatic Volunteers. PLoS ONE, 2014, 9, e116186.	2.5	55
30	The effects of age and gender on the lumbopelvic rhythm in the sagittal plane in 309 subjects. Journal of Biomechanics, 2015, 48, 3080-3087.	2.1	54
31	Stepwise reduction of functional spinal structures increase disc bulge and surface strains. Journal of Biomechanics, 2008, 41, 1953-1960.	2.1	51
32	Hydrogels for nucleus replacementâ€”Facing the biomechanical challenge. Journal of the Mechanical Behavior of Biomedical Materials, 2012, 14, 67-77.	3.1	51
33	Is it possible to estimate the compressive force in the lumbar spine from intradiscal pressure measurements? A finite element evaluation. Medical Engineering and Physics, 2013, 35, 1385-1390.	1.7	51
34	<i>In vitro</i> and <i>in silico</i> investigations of disc nucleus replacement. Journal of the Royal Society Interface, 2012, 9, 1869-1879.	3.4	50
35	In vivo loads on a vertebral body replacement during different lifting techniques. Journal of Biomechanics, 2016, 49, 890-895.	2.1	46
36	Interaction Between Finite Helical Axes and Facet Joint Forces Under Combined Loading. Spine, 2008, 33, 2741-2748.	2.0	42

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37	Dependency of disc degeneration on shear and tensile strains between annular fiber layers for complex loads. Medical Engineering and Physics, 2009, 31, 642-649.	1.7	42
38	Influence of lumbar spine rhythms and intra-abdominal pressure on spinal loads and trunk muscle forces during upper body inclination. Medical Engineering and Physics, 2016, 38, 333-338.	1.7	42
39	Impact of material and morphological parameters on the mechanical response of the lumbar spine â€“ A finite element sensitivity study. Journal of Biomechanics, 2017, 53, 185-190.	2.1	41
40	The effect of age and sex on the cervical range of motion â€“ A systematic review and meta-analysis. Journal of Biomechanics, 2018, 75, 13-27.	2.1	38
41	The effect of degenerative morphological changes of the intervertebral disc on the lumbar spine biomechanics: a poroelastic finite element investigation. Computer Methods in Biomechanics and Biomedical Engineering, 2011, 14, 729-739.	1.6	37
42	Effect of age and sex on lumbar lordosis and the range of motion. A systematic review and meta-analysis. Journal of Biomechanics, 2019, 82, 1-19.	2.1	34
43	Lumbar interbody fusion: a parametric investigation of a novel cage design with and without posterior instrumentation. European Spine Journal, 2012, 21, 455-462.	2.2	32
44	Monitoring the load on a telemeterised vertebral body replacement for a period of up to 65Âmonths. European Spine Journal, 2013, 22, 2575-2581.	2.2	32
45	Measurement of the number of lumbar spinal movements in the sagittal plane in a 24-hour period. European Spine Journal, 2014, 23, 2375-2384.	2.2	32
46	Is the ovine intervertebral disc a small human one?. Journal of the Mechanical Behavior of Biomedical Materials, 2013, 17, 229-241.	3.1	31
47	Effect of intervertebral disc degeneration on disc cell viability: a numerical investigation. Computer Methods in Biomechanics and Biomedical Engineering, 2013, 16, 328-337.	1.6	31
48	Computational analyses of different intervertebral cages for lumbar spinal fusion. Journal of Biomechanics, 2015, 48, 3274-3282.	2.1	30
49	Computational biomechanics of a lumbar motion segment in pure and combined shear loads. Journal of Biomechanics, 2013, 46, 2513-2521.	2.1	27
50	Relationship between intervertebral disc and facet joint degeneration: A probabilistic finite element model study. Journal of Biomechanics, 2020, 102, 109518.	2.1	27
51	Spinal loads as influenced by external loads: A combined in vivo and in silico investigation. Journal of Biomechanics, 2015, 48, 578-584.	2.1	26
52	Preload substantially influences the intervertebral disc stiffness in loadingâ€“unloading cycles of compression. Journal of Biomechanics, 2016, 49, 1926-1932.	2.1	26
53	Review of the fluid flow within intervertebral discs - How could in vitro measurements replicate in vivo?. Journal of Biomechanics, 2016, 49, 3133-3146.	2.1	26
54	Effect of disc degeneration on the mechanical behavior of the human lumbar spine: a probabilistic finite element study. Spine Journal, 2018, 18, 1910-1920.	1.3	26

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55	Investigation of different cage designs and mechano-regulation algorithms in the lumbar interbody fusion process â€" A finite element analysis. Journal of Biomechanics, 2014, 47, 1514-1519.	2.1	25
56	Development of a risk stratification and prevention index for stratified care in chronic low back pain. Focus: yellow flags (MiSpEx network). Pain Reports, 2017, 2, e623.	2.7	25
57	A new laser scanning technique for imaging intervertebral disc displacement and its application to modeling nucleotomy. Clinical Biomechanics, 2008, 23, 260-269.	1.2	24
58	In vivo implant forces acting on a vertebral body replacement during upper body flexion. Journal of Biomechanics, 2015, 48, 560-565.	2.1	23
59	Biomechanics of the L5â€"S1 motion segment after total disc replacement â€" Influence of iatrogenic distraction, implant positioning and preoperative disc height on the range of motion and loading of facet joints. Journal of Biomechanics, 2015, 48, 3283-3291.	2.1	23
60	Spinal Deformity Surgery: A Critical Review of Alignment and Balance. Asian Spine Journal, 2018, 12, 775-783.	2.0	23
61	Discretization error when using finite element models: Analysis and evaluation of an underestimated problem. Journal of Biomechanics, 2009, 42, 1926-1934.	2.1	22
62	Intradiscal pressure measurements: A challenge or a routine?. Journal of Biomechanics, 2016, 49, 864-868.	2.1	22
63	Parameters influencing the outcome after total disc replacement at the lumbosacral junction. Part 1: misalignment of the vertebrae adjacent to a total disc replacement affects the facet joint and facet capsule forces in a probabilistic finite element analysis. European Spine Journal, 2013, 22, 2271-2278.	2.2	21
64	In vivo measurements of the effect of whole body vibration on spinal loads. European Spine Journal, 2014, 23, 666-672.	2.2	21
65	Finite element study of human lumbar disc nucleus replacements. Computer Methods in Biomechanics and Biomedical Engineering, 2014, 17, 1762-1776.	1.6	21
66	Separate the Sheep from the Goats. Journal of Bone and Joint Surgery - Series A, 2017, 99, e102.	3.0	21
67	Fluid-flow dependent response of intervertebral discs under cyclic loading: On the role of specimen preparation and preconditioning. Journal of Biomechanics, 2016, 49, 846-856.	2.1	20
68	Posterior motion preserving implants evaluated by means of intervertebral disc bulging and annular fiber strains. Clinical Biomechanics, 2012, 27, 218-225.	1.2	19
69	Considerations when loading spinal finite element models with predicted muscle forces from inverse static analyses. Journal of Biomechanics, 2013, 46, 1376-1378.	2.1	19
70	Internal load-sharing in the human passive lumbar spine: Review of in vitro and finite element model studies. Journal of Biomechanics, 2020, 102, 109441.	2.1	19
71	Differences between clinical â€œsnap-shotâ€•and â€œreal-lifeâ€•assessments of lumbar spine alignment and motion â€" What is the â€œrealâ€•lumbar lordosis of a human being?. Journal of Biomechanics, 2016, 49, 638-644.	2.1	18
72	A method to obtain surface strains of soft tissues using a laser scanning device. Journal of Biomechanics, 2008, 41, 2402-2410.	2.1	17

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73	Prediction equations for human thoracic and lumbar vertebral morphometry. Journal of Anatomy, 2010, 216, 320-328.	1.5	17
74	Parameters influencing the outcome after total disc replacement at the lumbosacral junction. Part 2: distraction and posterior translation lead to clinical failure after a mean follow-up of 5 years. European Spine Journal, 2013, 22, 2279-2287.	2.2	17
75	How does the way a weight is carried affect spinal loads?. Ergonomics, 2014, 57, 262-270.	2.1	15
76	How do we stand? Variations during repeated standing phases of asymptomatic subjects and low back pain patients. Journal of Biomechanics, 2018, 70, 67-76.	2.1	15
77	Influence of spinal disc translational stiffness on the lumbar spinal loads, ligament forces and trunk muscle forces during upper body inclination. Medical Engineering and Physics, 2017, 46, 54-62.	1.7	14
78	Spinal loads and trunk muscles forces during level walking â€" A combined in vivo and in silico study on six subjects. Journal of Biomechanics, 2018, 70, 113-123.	2.1	13
79	Effect of arm swinging on lumbar spine and hip joint forces. Journal of Biomechanics, 2018, 70, 185-195.	2.1	13
80	The shape and mobility of the thoracic spine in asymptomatic adults â€" A systematic review of in vivo studies. Journal of Biomechanics, 2018, 78, 21-35.	2.1	12
81	Remedy for fictive negative pressures in biphasic finite element models of the intervertebral disc during unloading. Computer Methods in Biomechanics and Biomedical Engineering, 2011, 14, 293-303.	1.6	11
82	Review of existing measurement tools to assess spinal motion during prehospital immobilization. European Journal of Emergency Medicine, 2018, 25, 161-168.	1.1	11
83	Computational study of the role of fluid content and flow on the lumbar disc response in cyclic compression: Replication of in vitro and in vivo conditions. Journal of Biomechanics, 2018, 70, 16-25.	2.1	11
84	In vivo hip and lumbar spine implant loads during activities in forward bent postures. Journal of Biomechanics, 2020, 102, 109517.	2.1	11
85	Prediction of the human thoracic and lumbar articular facet joint morphometry from radiographic images. Journal of Anatomy, 2011, 218, 191-201.	1.5	10
86	Sensitivity analysis of the position of the intervertebral centres of reaction in upright standing â€" a musculoskeletal model investigation of the lumbar spine. Medical Engineering and Physics, 2016, 38, 297-301.	1.7	10
87	Structural Behavior of Human Lumbar Intervertebral Disc under Direct Shear. Journal of Applied Biomaterials and Functional Materials, 2015, 13, 66-71.	1.6	9
88	Are there characteristic motion patterns in the lumbar spine during flexion?. Journal of Biomechanics, 2018, 70, 77-81.	2.1	9
89	What does the shape of our back tell us? Correlation between sacrum orientation and lumbar lordosis. Spine Journal, 2018, 18, 655-662.	1.3	9
90	Sex-dependent differences in lumbo-pelvic coordination for different lifting tasks: A study on asymptomatic adults. Journal of Biomechanics, 2020, 102, 109505.	2.1	9

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91	Comparison of various contact algorithms for poroelastic tissues. Computer Methods in Biomechanics and Biomedical Engineering, 2014, 17, 1323-1334.	1.6	8
92	Automatic distinction of upper body motions in the main anatomical planes. Medical Engineering and Physics, 2014, 36, 516-521.	1.7	8
93	Application of a novel spinal posture and motion measurement system in active and static sitting. Ergonomics, 2015, 58, 1605-1610.	2.1	7
94	Does Total Hip Arthroplasty Affect Spinopelvic and Spinal Alignment?. Clinical Spine Surgery, 2022, 35, E627-E635.	1.3	7
95	Temporal and spatial variations of pressure within intervertebral disc nuclei. Journal of the Mechanical Behavior of Biomedical Materials, 2018, 79, 309-313.	3.1	6
96	Numerical simulations of bone remodelling and formation following nucleotomy. Journal of Biomechanics, 2019, 88, 138-147.	2.1	6
97	Sensitivity of the Cervical Disc Loads, Translations, Intradiscal Pressure, and Muscle Activity Due to Segmental Mass, Disc Stiffness, and Muscle Strength in an Upright Neutral Posture. Frontiers in Bioengineering and Biotechnology, 2022, 10, 751291.	4.1	6
98	Comparison of three validated systems to analyse spinal shape and motion. Scientific Reports, 2022, 12, .	3.3	6
99	Spine loading and deformation â€“ From loading to recovery. Journal of Biomechanics, 2016, 49, 813-816.	2.1	5
100	Normal trabecular vertebral bone is formed via rapid transformation of mineralized spicules: A high-resolution 3D ex-vivo murine study. Acta Biomaterialia, 2019, 86, 429-440.	8.3	5
101	Review article on spine kinematics of quadrupeds and bipeds during walking. Journal of Biomechanics, 2020, 102, 109631.	2.1	5
102	Sex-Dependent Estimation of Spinal Loads During Static Manual Material Handling Activitiesâ€"Combined in vivo and in silico Analyses. Frontiers in Bioengineering and Biotechnology, 2021, 9, 750862.	4.1	5
103	Spinal fusion without instrumentation â€“ Experimental animal study. Clinical Biomechanics, 2017, 46, 6-14.	1.2	4
104	Which is the best-suited landmark to assess the thoracic orientation?. Journal of Biomechanics, 2020, 102, 109545.	2.1	4
105	Optimal assessment of upper body motion â€“ Which and how many landmarks need to be captured for representing rigid body orientation?. Journal of Biomechanics, 2022, 132, 110952.	2.1	3
106	How reproducible do we stand and sit? Indications for a reliable sagittal spinal assessment. Clinical Biomechanics, 2019, 70, 123-130.	1.2	2
107	Is the sheep a suitable model to study the mechanical alterations of disc degeneration in humans? A probabilistic finite element model study. Journal of Biomechanics, 2019, 84, 172-182.	2.1	2
108	Spinal Loads during Cycling on an Ergometer. PLoS ONE, 2014, 9, e95497.	2.5	2

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109	2nd international workshop on spinal loading and deformation. Journal of Biomechanics, 2018, 70, 1-3.	2.1	1
110	Differences in 3D vs. 2D analysis in lumbar spinal fusion simulations. Journal of Biomechanics, 2018, 72, 262-267.	2.1	1
111	Preoperative Segmental Disc Geometry as a Possible Predictor fo r the Clinical Outcome of Lumbosacral Total Disc Replacement. Journal of Spine, 2016, 05, .	0.2	0
112	Association between hamstring flexibility and lumbopelvic posture and kinematics during ergometer rowing. Translational Sports Medicine, 2019, 2, 380-386.	1.1	0
113	3rd International workshop on spinal loading and deformation. Journal of Biomechanics, 2020, 102, 109627.	2.1	0
114	The sagittal sways of back lordosis and sacral orientation during still standing at different arm positions. Journal of Biomechanics, 2021, 114, 110149.	2.1	0
115	Characteristics of Lumbar Flexion Rhythm at Different Arm Positions. World Neurosurgery, 2021, 152, e81-e85.	1.3	0