

Division of Mechanical Science and Engineering	Research field	Biomechanics	Lab. ID
			MS22
Laboratory web site	http://bios.w3.kanazawa-u.ac.jp/engineering/		
Research subjects			
<p>Biomechanics of human body for medical treatment, welfare and health technology by using CAE (Computer Aided Engineering) are studied in this study group. Furthermore, biomechanics of animal and plant for considering mechanical adaptation of nature and "Bionic Design" (bio-inspired design) to apply engineering design are studied. We analyze mechanical stress and strain condition on the inside of human body to approach clinical problem involved biomechanics by using CAE such as finite-element method and simulation procedure of musculoskeletal system. We also analyze stress and deformation of animal and plant, which have special structure, tissue and function, to get inspiration for mechanical engineering design.</p>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>Graduate students have a seminar about biomechanics and bionic design by all the members as well as standard tuition. In the seminar, students give presentation about current results of own research subject, or review related papers, and have a free discussion with exchanging their ideas. All of the presentation, review and discussion is held by English.</p>			
Daily life in the laboratory, etc.			
<p>We study collaborating with the nursing laboratory and the orthopedic laboratory of medical science school, so students have chance to interchange with researchers of the different fields. There are unusual materials and equipment in the laboratory as the mechanical engineering, such as a hospital bed, dummy models of human body, skeletal preparations, etc.</p>			
Message or comments by the laboratory faculty staffs			
<p>We think "learning by yourself" is a basis for graduate student's research. Graduate students should work on their research subjects while deepening the understanding by their pace. A different field exchange can make new idea and technology, therefore discussion between the students who work on a different subject is important to rise their knowledge and capacity.</p>			
Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2017.3	Development of the bio-innovative design technology using bone shape and its applications		
2017.3	A study on finite-element analysis of curved folding structure and its application		
2017.3	A study on efficiency of the bed sore prevention mattress by using musculoskeletal models		
2017.3	A study on optimum design of stiffeners layout of thin-walled structures considering buckling		
2016.3	Development of Design Optimization Technique of Cross-Sectional Shape of Thin Walled Structure by Evolutionary Computation Considering Buckling		
2016.3	The Development of a Hip Dummy Model for Mechanical Evaluation of Body Pressure Dispersion Mattresses		
2015.3	Development of a finite-element model of the buttocks for using mechanical evaluation of body pressure dispersion mattress		
2014.3	A study on the orthodontic force by using the orthodontics simulation based on a stress of a periodontal ligament		
2014.3	Mechanical analysis of giraffe neck by using musculoskeletal model		
2013.3	Finite element analysis of bone stress and muscle force in the musculoskeletal system of spine		
2013.3	Development of a finite-element model of the human finger and its application for injury risk		
2013.3	Optimization of cooling channel of a plastic injection molding die by using a topology optimization method		
2013.3	A study on a rocking mechanism of curved folding plastic sheet		
2012.9	The optimization design of cooling fin of LED heat sink		
2012.9	A study on the risk evaluation of the wrist bone fracture due to fall down		
Recent Doctoral theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2012.9	Optimum design of HGV front structure for pedestrian safety		
2010.9	A study on the residual stress of the autochory plant fruits		
2006.3	Development of an individual mechanical analysis method of bone based on medical images and its application		
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