

Division of Mechanical Science and Engineering	Research field	Mechanism Design	Lab. ID MS13
Laboratory web site	http://mechs.ms.t.kanazawa-u.ac.jp [in Japanese]		
Research subjects			
<p>Our laboratory is composed of three research groups: textile machinery group [Machine], textile kansei engineering group [Kansei], and nano-scale computational simulation group [Nano].</p> <p>[Machine] We develop technological elements in order to match the needs for high performance textile machinery. We also research mechanical properties of fiber assemblies those are main fields of textile machinery.</p> <p>[Kansei] The visual judgement by skilled workers is required to produce excellent engineering products. However, it is quite difficult to quantify their judgment criterions. Therefore, for visual judgement by unskilled workers, our goal is to develop a new method to obtain objective and quantitative criteria by elucidating roles of each visual information in visual judgements.</p> <p>[Nano] The strength of solid materials is studied through atomic- and nano-scale phenomena. Because it is not easy to elucidate the nano-scale phenomena only by a theoretical/experimental approach, we adopt the atomic-scale computer simulation approach. Our goal is to propose a new guiding principle for the design of materials with excellent mechanical properties by discovering "beautiful, reasonable atomic collective behavior" from the motion of a huge number of atoms expressed by atomic simulations.</p>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>[Machine] We have a joint seminar with another research group every week. We think that it is important to discuss other topics related to your subject. We also have one-on-one meeting a week in order to promote your subject.</p> <p>[Kansei] We hold three kinds of meetings every week, a joint seminar with other research group, our group seminar, and an one-on-one meeting.</p> <p>[Nano] Original research subjects are given to each graduate student. Almost every week, students are required to report their studies to the group leader and discuss with him. Reviews of selected papers in English is given by students by turns every two weeks to obtain the latest knowledge required to promote their research activities. Almost every student attends domestic conferences held in various places in Japan and sometimes wins a prize for his excellent presentation.</p>			
Daily life in the laboratory, etc.			
<p>Personal working desk with a personal computer is available for every student.</p> <p>[Machine] All relevant students of undergraduate, Master, Doctor share the laboratory rooms, and everyday free discussion on textile engineering or related topics are strongly encouraged.</p> <p>[Kansei] I was able to solve the questions of the study by my ideas and ingenuity. Own ideas are reflected directly in the results of the study. (Graduates)</p> <p>[Nano] Our group have a large number of high performance workstations, so every student can freely perform computer simulations according to your original idea.</p>			
Message or comments by the laboratory faculty staffs			
<p>[Machine] Almost Master graduates take occupation as engineers in Japanese famous manufacturer. Very few MC graduates entered the Doctor course. Doctoral course graduates got some research occupation such as teachers in technical colleges or polytechnic college, researchers in research institutes in local governments.</p> <p>[Kansei] We think it is very important ability for you to discuss with reasonable considerations and ideas. Let's develop new objective evaluation method together!</p> <p>[Nano] It is a great pleasure for us to find new ideas and phenomena not yet discovered. We want to share the pleasure with you. But, unfortunately, we do not know the shortcut to success. Only we can do is to face the research subjects in sincerity and use our brains as much as possible. Let's investigate "beautiful, reasonable atomic collective behavior" while being excited together!</p>			
Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2017.3	Image Processing Method for Detection of Uneven Dyeing of Knitted Fabric		
2017.3	Atomic simulations of hetero-interface mediated plasticity in pearlitic steels		
2017.3	Effect of braiding structure on bending property in Carbon Fiber Reinforced Plastics		
2017.3	Influence of heat generated by friction between yarn guide and high-speed running synthetic yarn on its mechanical properties		
2017.3	Air Flow Analysis around High-speed Rotating Roller		
2017.3	Atomistic and dislocation studies of influence of grain boundary structures on dislocation emission from grain boundaries		
2017.3	Effect of Knitted Fabric on Lightness Distribution of Leg		
2017.3	Influence of lattice-defect types on size dependence of mechanical properties in nanostructured materials		

2016.3	Atomic simulations of void strengthening mechanism in crystalline materials
2016.3	Surface Characteristics Evaluation for Fabrics by Tactile Sensor
2016.3	Motion analysis in band storage mechanism of tying machine
2016.3	3-dimension simulation for loop structure of knitted fabric considering mechanical properties of yarn
2016.3	Atomic simulations of dislocation generation from twist grain boundaries
2016.3	Atomic simulations of mechanical properties in ductile-brittle composite materials
2015.3	Atomistic study of plastic deformation propagation phenomena mediated by grain boundaries in ultrafine-grained metals [Nano]
2015.3	Atomic simulations of mechanical properties of ferrite/cementite multilayered composite materials [Nano]
2015.3	Influence of grain boundary dislocation source hardening on ductile properties in nanostructured metals [Nano]
2015.3	Air Flow Analysis on Spinning System for Synthetic Fiber Yarn [Machine]
2015.3	Friction Characteristic between Synthetic Fiber and Yarn Guide under High-speed Feeding [Machine]
2015.3	Basic Research on Reducing Energy Consumption for Rotating Roller at High Speed [Machine]
2015.3	Development of Evaluation Method for Uneven Dyeing by Image Analysis [Kansei]
2014.3	Atomic simulations of mechanical properties of multilayered composite materials [Nano]
2014.3	Influence of grain boundaries on mechanical fields of lattice dislocations: Atomic simulation analyses [Nano]
2014.3	Dislocation emission phenomena from grain boundaries investigated by molecular dynamics simulations [Nano]
2014.3	Rope Passage Simulation for Mold Type Knotter [Machine]
2014.3	3-dimensional Simulation for Tensile Behaviour in Multi-filament Yarn [Machine]
2014.3	Representation of Hand for Fabrics Using Friction Characteristics Measured by Tactile Sensor [Machine]
2014.3	Improvement of Evaluation Method for Aesthetic properties of Pantyhose by Estimation of Lightness Difference Distribution [Kansei]
2013.3	Influence of dislocation emission phenomena from plane defects on the fracture toughness [Nano]
2013.3	Energetic study of dislocation emission phenomena from grain boundaries [Nano]
2013.3	Yarn Thickness Control using Draw-ratio Change for Doubly Stacked Multi-disk Spindle in False-twist Process [Machine]
2013.3	Noise Distribution around Jet-loom [Machine]
2013.3	Evaluation of Surface Characteristics of Fabrics by Rotationally Dragging Tactile Sensor [Machine]
2013.3	Development of Evaluation Method for Aesthetic properties of Pantyhose using Leg Mannequin - Estimation by Gray Level Difference between Human Leg and Leg Mannequin - [Kansei]
Recent Doctoral theses in these 3 years (+ more if appropriate)	
year.month	Thesis title (including English translation of Japanese thesis title)
2017.3	Study on 3- Dimension Simulation for Loop Structure of Weft- Knitted Fabric Considering Mechanical Properties of Yarn
2015.3	Study on Development of Textile CAD System for 3-dimensional Designing [Machine]
2014.3	Atomistic study of unique mechanical properties of ultrafine-grained metals based on dislocation-lattice defect interactions [Nano]
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