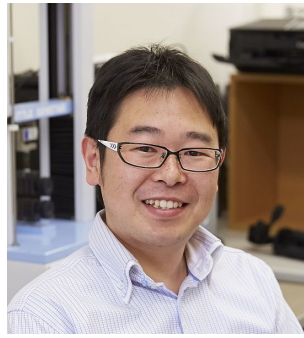


Requests for Collaboration

Name: Makoto Uchida Current position: Assistant Professor E-mail address: uchida@imat.eng.osaka-cu.ac.jp	
Research Interests	
<ul style="list-style-type: none">● Mechanical modeling of nonlinear deformation of polymer● Evaluation and prediction of nonuniform deformation● Multiscale simulation of elasto-viscoplastic deformation of engineering materials	
Creative Achievements in The Application of New and Existing Science and Technology	
<p>(1) The nonlinear deformation behaviors of polymeric materials, e.g., thermoplastic and thermosetting polymers, amorphous and semi-crystalline polymers, rubber, gel and composite, were represented by the kinetics of polymer chain consisting of the microstructure of the material. The established nonlinear mechanical model will predict the mechanical performance relating with the microstructure.</p> <p>(2) Nonuniform deformation caused on the surfaces of material and structure can be accurately evaluated by the homemade DIC software. The software contributed the evaluation of necking in the thermoplastic polymer, determination of slip deformation in the polycrystalline metal, estimation of the mechanical response of hydrogel in large strain range, and so on.</p> <p>(3) Engineering materials usually have the microscopically heterogeneous structure, and it characterize the macroscopic mechanical property. The multiscale FEM simulation procedure, which is capable to several materials, is established based on the homogenization method. It can help the development of design of the microscopic structure.</p>	
Technology (Product, Process, Device, Service etc.) That I Want to Request for Collaboration	
<ul style="list-style-type: none">● Prediction of mechanical performance of polymeric material● Accurate evaluation of nonuniform deformation of structure and material	
A List of 5 Key Publications	
<ul style="list-style-type: none">• Estimation of Slip Deformation of Polycrystalline Pure Copper using Digital Image Correlation Method and Crystalline Plasticity Theory , M. Uchida, A. Taniguchi and Y. Kaneko, <i>Advanced Experimental Mechanics</i>, 3, 135-140, (2018).• Experimental modeling of nonuniform deformation in finite volume evaluation region of heterogeneous material, M. Uchida and Y. Kaneko, <i>Heliyon</i>, 4, e00578, (2018).• Quantitative evaluation of the development of stress and strain fields using digital image correlation and finite element methods, M. Uchida, T. Ueno, T. Abe and Y. Kaneko, <i>Advanced Experimental Mechanics</i>, 2, 76-81, (2017).• Micro-, meso- to macroscopic modeling of deformation behavior of semi-crystalline polymer, M. Uchida and N. Tada, <i>International Journal of Plasticity</i>, 49, 164-184, (2013).• Sequential evaluation of continuous deformation field of semi-crystalline polymers during tensile deformation accompanied by neck propagation, M. Uchida and N. Tada, <i>International Journal of Plasticity</i>, 27, 2085-2102, (2011).	