SECTION 1 : ENGINEERING
Special Contribution
Interdisciplinary Research Activities on Disaster Prevention and Mitigation at Kobe University by Forming Collaboration COE

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Abstract. Disaster prevention and mitigation researches are essentially interdisciplinary and have to be practical. The ultimate objective of the researches is to protect lives and living spaces from natural hazards and their contents widely vary from scientific areas to social affairs; i.e. emergency disaster rescue and life-saving, evacuation, shelter, crisis management, damage estimation, victim care during recovery and reconstruction, resilient living infrastructure, industrial infrastructure, temporary housing and reconstruction residential development, disaster tolerant promotion, methods of volunteer support, disaster preparation, damage estimation, hazard maps, disaster prevention education and so forth. How can the linkage and cooperation be realized between them? How can they be made converge on the ultimate objective? Here, introduced is a trial made to achieve the interdisciplinary researches at the stage of the disaster prevention and mitigation COE at the Kobe University Research Center for Urban Safety and Security, which has been established through collaboration with AICS, JAMSTEC and E-Defense with cooperation from the Kobe City Office, the Hyogo Prefectural Government and Kobe Shimbun (newspaper publisher).

Keywords: disaster, prevention, mitigation
Mechanical Characterization of Cells Exposed to Mechanical Loading

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Abstract. Vascular endothelial cells in vivo are exposed to complex mechanical forces including fluid shear stress, cyclic stretch and hydrostatic pressure. These mechanical forces are important factors in endothelial cell remodeling. So far, a lot of efforts have been done to study the effects of mechanical stimuli on cell remodeling; however, little is still known of how mechanical forces are transmitted through cells to activate intracellular signaling cascades leading to alterations in cell functions. To further address this issue, it should be required to know intracellular mechanical environment including mechanical properties of subcellular structural components such as actin filaments, nucleus and so forth. The objective of this talk is to present recent findings related to cell biomechanics, introducing mechanical tests of cell body as well as intracellular organelles.
Analyses of Mobile Positioning Data

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Abstract. Progress in the field of information sources, their digitization, visualization and analytical data extraction makes possible to enhance data about society behavior, demographic characteristics, etc. Mobile devices apart from their main purpose to support and provide various applications to their users also in parallel generate a big amount of signaling data that reflect the devices’ usage and movement in a network. Due to high penetration and massive usage of mobile devices, these devices become then a unique source of information describing the behavior of users in space and in time. Positioning data allows data owners (mobile operates) to develop and to provide new innovative services that can be used in decision-making processes. In this talk, we will discuss how mobile users can be classified and mapped into an area of interest based on mobile positioning data. Furthermore, a utilization of such data to detect people traveling in public transport like busses and trains, and to determine where people get on and get off will be outlined.

Keywords: mobile, positioning data