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Coordination and Collaboration Functions of Disaster Management Centers for Humanitarian Logistics: A Case Study at Merapi Eruption

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Abstract

Although the humanitarian logistics coordination model in Indonesia is fairly effective, the role of each player remains unclear. For example, some of the activities that are sufficient to be done by one agency are in fact done by other institutions as well. This has resulted in inefficiency and ineffectiveness regarding on the handling of disaster relief goods. Therefore, it is essential to determine the role of each stakeholder involved in the management of natural disasters in order to improve the model. This study was conducted to provide the proposed model of humanitarian logistics coordination for developing the framework of coordination between stakeholders in the management of natural disasters, with the involvement of logistics players through the RASIC Chart method. © The Authors, published by EDP Sciences, 2018.

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Fatigue Testing and Evaluation of Fatigue Strength under Multiaxial Stress State; Why do we need fatigue testing?

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Abstract. Types of multiaxial fatigue tests and their experimental results are presented in this paper. There are typical three types in multiaxial fatigue tests: the combining push-pull and reversed torsion loading test using hollow cylinder specimen, the biaxial tension-compression test using cruciform specimen and the inner pressure applied the push-pull loading test using the hollow cylinder specimen. In the combining a push-pull loading and a reversed torsion loading test, failure life under non-proportional loading in which principal directions of stress and strain were changed in a cycle was shortened compared to proportional loading in which those are fixed. Fatigue lives were well-correlated using a non-proportional strain range considering the effect of strain path and material dependence. In the biaxial tension-compression test, the failure life decreased with increase of the principal strain ratio. In the inner pressure applied the push-pull loading test, cyclic deformation behaviour due to complex loading paths of multiaxial fatigue tests with the inner pressure associated with push-pull and rev. torsion acted to reduce the failure lives. Experimental investigation of multiaxial failure life and elucidation of their governing mechanism is essential and it can broaden the applicability of structural components.

1 Introduction

Investigation of fatigue properties is essential for design of structural components. In practical application, structures are subjected to complex multiaxial load. Therefore, the understanding of multiaxial fatigue properties of materials is important. Indeed, failure lives are overestimated when the effect of multiaxiality is neglected. Multiaxial fatigue testing usually has been carried out using a hollow cylinder specimen by applying push-pull loading and a reversed torsion loading and the applicability of multiaxial stress and strain parameters has been discussed [1-5]. However, a principal strain ratio (ϕ) and a principal stress ratio (λ) ranges performable by the testing method are $-1 \leq \phi \leq -\nu$ and $-1 \leq \lambda \leq 0$, where ν is the Poisson's ratio. Structural components sometimes undergo fatigue damage at principal strain/stress ratios in excess of the above range under service loading. In

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Coordination and Collaboration Functions of Disaster Management Centers for Humanitarian Logistics: A Case Study at Merapi Eruption

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Abstract. Although the humanitarian logistics coordination model in Indonesia is fairly effective, the role of each player remains unclear. For example, some of the activities that are sufficient to be done by one agency are in fact done by other institutions as well. This has resulted in inefficiency and ineffectiveness regarding on the handling of disaster relief goods. Therefore, it is essential to determine the role of each stakeholder involved in the management of natural disasters in order to improve the model. This study was conducted to provide the proposed model of humanitarian logistics coordination for developing the framework of coordination between stakeholders in the management of natural disasters, with the involvement of logistics players through the RASIC Chart method.

1 Introduction

Disaster is a term that refers to a physical disorder that affects the system as a whole and threatens its priorities and goals [1,2]. The importance of disaster management should encourage the successful implementation of an emergency response effort that starts with strategic planning [2,3]. Disaster response is generally composed of four phases [4], namely mitigation, preparation, response, and recovery.

Indonesia is one of the countries located in the disaster zone. The requirement of an integrated natural disaster management system is satisfied by the disaster logistics management system. Logistics management of disasters requires support via information about the needs of humanitarian goods, a system that is able to quickly provide the information needs of victims, the distribution of the sacrificial site, and listing the logistics needs of disaster victims at the scene of the disaster as well at any evacuation point. In order to improve the performance of natural disaster relief operations, logistics and inventory management activities are necessary. The role of logistics systems is to provide the necessary relief items quickly and efficiently. Though the humanitarian logistics coordination model in Indonesia is fairly effective, the role of each player remains unclear. Coordination among relief agencies is an important aspect to be noted. Lack of coordination and cooperation among humanitarian agencies is one of the obstacles in humanitarian logistics [5]. Coordination and cooperation among organizations prevents

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An Integration of PSO-based Feature Selection and Random Forest for Anomaly Detection in IoT Network

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Abstract. The most challenging research topic in the field of intrusion detection system (IDS) is anomaly detection. It is able to repeal any peculiar activities in the network by contrasting them with normal patterns. This paper proposes an efficient random forest (RF) model with particle swarm optimization (PSO)-based feature selection for IDS. The performance model is evaluated on a well-known benchmarking dataset, i.e. NSL-KDD in terms of accuracy, precision, recall, and false alarm rate (FAR) metrics. Furthermore, we evaluate the significance differences between the proposed model and other classifiers, i.e. rotation forest (RoF) and deep neural network (DNN) using statistical significance test. Based on the statistical tests, the proposed model significantly outperforms other classifiers involved in the experiment.

1 Introduction

The present escalation of Internet of Things (IoT) devices and services has changed our daily life dramatically. Many applications are built based on IoT technologies, i.e. smart cities, smart health care, smart home and vehicular networks [1]. Apart from these benefits, attackers may take this such opportunity to launch malevolent code or program to the network. According to [2], security is a key barrier of the implementation of IoT network and services. This is because IoT works with different standard and protocol forming a heterogeneous network. Moreover, IoT devices prevalently produce a huge amount of data so it might become a big threat as malicious users can intercept the data while it is transmitted.

As the development of IoT devices increase, insecure information processing might immediately affects to the whole IoT network. The jeopardy of information disclosure in public space will increase caused by the broadly development of IoT. As presented in Figure 1, security architecture in IoT is divided into three layers, i.e. perception layer, transportation layer, and application layer [3] [4]. Transportation layer comprises network access security which is responsible for attack detection and prevention. An intrusion detection system (IDS) is one security solution which can be deployed in the transportation

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Design studies of inner and outer embedded Permanent Magnet for hybrid electric vehicles

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Abstract. Hybrid vehicles require high torque for propel, hence permanent Magnet machines are highly suiting for the improvement in the torque density. The paper focus on designing built-in interior permanent magnet (IPM) synchronous machine for hybrid electric drive. With the permanent magnet switched from rotor to stator and the characteristics over a wide range of speed operation is studied. The results obtained though performance analysis shows that at 130 rpm high torque with power peaking at around 900 rpm. Both the inner and outer machine are studied using numerical study tool for performance analysis for the application mentioned above. The inner magnet rotor design has provide a better magnetic flux flow due to the larger flux linkage between the permanent magnet and stator pole. Both type of machines are evaluated for torque where the machine with inner magnet provide a higher torque density of 4.94% as compared to the outer magnet machines.

1 Introduction

Unlike internal combustion engine (ICE) vehicles, the mechanical losses are converted into heat and dissipate to surrounding which does not practice the concept of energy efficiency [1-2]. Hybrid vehicles operate based on permanent magnet machine where magnetic flux linkage generated from the overlapping of magnetic field between permanent magnet and electromagnet [3]. The brushless permanent magnet DC machines have advantages over other machines such as simpler to maintain, more durable, and compact, less likely to suffer reduction in torque performance. The issues occurred where the fixed magnetic field in the stator could not increase the torque density due to difficulty in controlling the magnetic flux. [4-5]. A new type of design that includes two rotors one inside the machine and the other outer rotor enable applications in future wherein the operating mode is feasible in either simultaneous or independent operations using control techniques. A comparative design analysis using torque density value as evaluation parameter is presented to suiting to a hybrid electric vehicle.

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