



Editorial Introduction to Special Issue on Symmetry in Mechanical Engineering

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1. Introduction

Recent advancements in mechanical engineering are an essential topic for discussion. The topics relating to mechanical engineering include the following: measurements of signals of shafts, springs, belts, bearings, gears, rotors, machine elements, vibration analysis, acoustic analysis, fault diagnosis, construction, analysis of machine operation, analysis of smart-material systems, integrated systems, stresses, analysis of deformations, analysis of mechanical properties, signal processing of mechanical systems, and rotor dynamics. Mechanical engineering deals with solid and fluid mechanics, rotation, movements, materials, and thermodynamics.

2. The Content

This Special Issue, with 15 published articles, presents the topic "Symmetry in Mechanical Engineering". The presented topic is interesting. It is categorized into eight different sections:

- deformation;
- stresses;
- mechanical properties;
- tribology;
- thermodynamic;
- measurement;
- fault diagnosis;
- machine;

The authors of the first paper analysed the self-excited vibration of a thin spur gear caused by the initial transverse vibration [1]. The article [2] described a new technique to identify sectional deformation modes of the doubly symmetric thin-walled cross-section. The matching model of the dual mass flywheel and the power transmission by integration of the sensitivity analysis method was presented in the paper [3]. In the paper [4], the authors presented an approach for the active control of structural vibration. The authors of the paper [5] presented an approach to the correction of optical measurement results of fertilizer particles. Fault diagnosis of the rolling bearing using vibration

signals was presented in [6]. A study of the effect of medium viscosity on breakage parameters for wet grinding was presented in [7]. The monitoring method for the wear state of a tool using a convolutional bidirectional LSTM model was shown in the article [8]. The use of structural symmetries of a U12 engine using vibration analysis was presented in [9].

The Special Issue contains other interesting papers about mechanical engineering. The presented solutions, methods, and approaches can be improved and used in the future. Moreover, mechanical engineering is essential for fault diagnosis of machines [10–22] and the analysis of temperature [23–25]. The mechanical properties of materials are also investigated in the literature [26–28]. Acoustic analysis is also profitable for the analysis of the power transformer and detection of defects in on-load tap-changers [29,30]. Acoustically induced cavitation bubbles in insulating oil are also presented in the literature [31].

3. Summary

The development of techniques and methods related to mechanical engineering is growing every month. The described articles have contribution to mechanical engineering. The proposed research can find applications in factories, oil refineries, and mines. It is essential to develop new improved methods, techniques and devices related to mechanical engineering.

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