

Lecture Notes in Mechanical Engineering

Amiril Sahab Abdul Sani ·
Muhammed Nafis Osman Zahid ·
Mohamad Rusydi Mohamad Yasin ·
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Ahmad Rosli Abdul Manaf · Siti Nadiah Mohd Saffe ·
Radhiyah Abd Aziz · Faiz Mohd Turan *Editors*

Enabling Industry 4.0 through Advances in Manufacturing and Materials

Selected Articles from iM3F 2021,
Malaysia

 Springer

Lecture Notes in Mechanical Engineering


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Preface

The second edition forum of The Innovative Manufacturing, Mechatronics and Materials Forum 2021 (iM3F 2021) organized by Universiti Malaysia Pahang through its Faculty of Manufacturing and Mechatronic Engineering Technology was held on 20 September 2021. The main field focuses on manufacturing, mechatronics as well as materials.

More than 132 submissions were received during iM3F 2021 and were reviewed in a single-blind manner, and 60 papers were advocated by the reviewers to be published in the Lecture Notes in Mechanical Engineering. The editors would like to express their gratitude to all the authors who submitted their papers. The papers published in this proceeding have been thoroughly reviewed by the appointed technical review committee consisting of various experts in the field of mechanical, manufacturing and material engineering sciences.

The conference had brought a new outlook on cutting-edge issues shared through keynote speeches by Prof. Ir. Dr. Jamaluddin Mahmud and Prof. Dr. Mohammad Osman Tokhi.

Finally, the editors hope that readers find this volume informative as we thank LNME for undertaking this volume publication. We also would like to thank the conference organization staff and the International Program Committees' members for their hard work.

Pekan, Pahang, Malaysia
November 2021

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Improvement of roof shield design using TRIZ method

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ABSTRACT

Factors such as poor aerodynamic shape, rigid roof and lack of attractiveness are the few factors that need to be taken into consideration for the roof shield design of a utility motorcycle. The purpose of this study is to improve the current design of the roof shield using TRIZ tools and techniques. The current design has some limitations due to the inventive parameters conflict of each component and causes engineering contradiction. Therefore, the TRIZ method is employed as a method to eliminate those inventive limitations. Function analysis is chosen as the initial step to determine the involved components and the components that are needed in the system. TRIZ method with the use of causes-effects chain analysis (CECA) then is applied by building the problem chain to obtain the potential effective cause. Using this approach, the engineering contradiction of the roof shield component is identified. Next, 40 inventive principles matrix in TRIZ, is applied to obtain a potential solution to the contradiction. Further brainstorm then is carried out to improve the design based on trigger potential inventive solution. The final conceptual design is sketched out and it is found that the overall design of the roof shield is improved in term of aerodynamic, flexibility and attractiveness.

KEYWORDS

Cause and effect chain analysis; Function analysis; Motorcycle; Roof shield; TRIZ

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