Modelling of Mobility Mechanism for Motorized Adjustable Vertical Platform (MAVeP)

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2018 IEEE INTERNATIONAL CONFERENCE ON AUTOMATIC CONTROL AND INTELLIGENT SYSTEMS (I2CACIS)
Book Group Author(s): IEEE
Pages: 39-46
Published: 2018
Document Type: Proceedings Paper

Conference

Conference: IEEE International Conference on Automatic Control and Intelligent Systems (I2CACIS)
Location: Shah Alam, MALAYSIA
Date: OCT 20, 2018
Sponsor(s): IEEE; IEEE Malaysia Sect Control Syst Soc Chapter; SCOPUS; PICon; Univ Teknologi Mara

Abstract

During the thermal vacuum, acoustic and vibration test procedure before launching, a satellite needs to be transported from one test area to another area using a mobile platform. To cater the demand, a special platform called Motorized Adjustable Vertical Platform (MAVeP) has been designed and assembled to ensure a smooth transfer operation and to reduce the handling risk that may jeopardize the satellite. This platform is able to move around and equipped with a height adjustable mechanism to elevate the satellite. This paper focuses on the design and modelling of MAVeP mobility. High accuracy and repeatability parking is an important criteria in the mechanical and electrical design. Kinematics and dynamic model of MAVeP mobility is described in this paper and verified experimentally. The result show that the kinematic and dynamic modelling errors are 0.08m respectively and MAVeP is able to move in a confined environment and desired.

Keywords

Author Keywords: Mobile satellite platform; satellite testing; mecanum wheels; mobile trolley; mobility mechanism

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Funding

Funding Agency	Grant Number
Ministry of Science, Technology and Innovation (MOSTI)	L03010106001701

View funding text

Publisher

IEEE, 345 E 47TH ST, NEW YORK, NY 10017 USA

Categories / Classification

Research Areas: Automation & Control Systems; Computer Science

Web of Science Categories: Automation & Control Systems; Computer Science, Artificial Intelligence

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1 of 1

Cited References: 8

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1. **Thermal Vacuum Chamber Specification** **Times Cited: 1**
   Group Author(s): ANGKASA
   THERM VAC CHAMB SPEC

2. **Main Assembly of Machine Structure** **Times Cited: 1**
   By: Hamad , Sanusi; Ishak, M. R.
   MAIN ASSEMBLY MACHIN Published: 2016

3. **The Sources of Position Errors of Omni-directional Mobile Robot with Mecanum Wheel** **Times Cited: 1**
   By: Han , K.; Kim , H.; Lee , J.S.
   SOURCES POSITION ERR Pages: 581-586

4. **KARI's Testing Facilities and Technologies for GEO Satellite Development** **Times Cited: 1**
   By: Lee, S. S; Choi, S.W; Kim, H.B.
   Inst. Electron. Inf. Commun. Eng. Volume: 103 Issue: 359 Pages: 71-76 Published: 2002
   K. Z

5. **Setting-Up The Assembly, Integration And Test Centre In Malaysia** **Times Cited: 2**
   By: Leng, Elena Woo Lai; Ismail, Maszlan; Subari, Mustafa Din
   RAST 2009: PROCEEDINGS OF THE 4TH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN SPACE TECHNOLOGIES Pages: 453-458 Published: 2009

6. **Modeling and Adaptive Control of an Omni-Mecanum-Wheeled Robot** **Times Cited: 18**
   By: Lin, L. C.; Shih, H. Y.
   Intelligent Control and Automation Volume: 4 Pages: 166-179 Published: 2013

7. **Environmental Testing for Launch and Space Vehicles** **Times Cited: 1**
   By: Perl , W.J.; Do, T.
   Crosslink Publ. Volume: 6 Issue: 3 Published: 2005
   P. A

8. **Design and Development of Motorized Adjustable Verticle Platform(MA VeP)for Satellite Test Facility** **Times Cited: 1**
   By: Woo , E.; Leng , L.; Salim , H.; et al.
   DESIGN DEV MOTORIZED Article Number: 0-3 Published: 2015
   [Show additional data]

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