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## Design and material analysis of spherical mobile robot for bouncing mechanism (Conference Paper)

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### Abstract

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A spherical mobile robot with a spherical steel spokes shell is introduced in this paper. To have the optimum bouncing capability, the shell configurations should be optimized. The design technique of the optimization is by varying and testing the three main parameters which are the material of the spokes, the number of spokes and diameter for each spoke. The material used in the study are five common commercial material available – 1060 alloy, ASTM A36 steel, cast alloy steel, e-glass fiber and plain carbon steel. The test simulation is run by model in Simulink and SimMechanics. The highest maximum height of bounce indicates the best parameter. It is shown that the ASTM A36 steel with 14 spokes and 4.00 mm in diameter is the optimum configuration of the spherical mobile robot. © IFIP International Federation for Information Processing 2015.

### Author keywords

Bouncing Design technique Spherical mobile robot

### Indexed keywords

Engineering controlled terms: Artificial intelligence Carbon Carbon steel Machine design Mobile robots Robots  
 Spheres Steel fibers

- Bouncing
- Commercial materials
- Design technique
- Main parameters
- Material analysis
- Optimum configurations
- Plain carbon steels
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Engineering main heading: Alloy steel

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