



L. Yan, I.-M. Chen, C.K. Lim, G. Yang, K.-M. Lee

Design, Modeling and Experiments of 3-DOF Electromagnetic Spherical Actuators

Series: Mechanisms and Machine Science

- First monograph which systematically treats multi-DOF spherical actuators
- Important in the development of applications in the fields of robotics, automobile, aerospace, manufacturing and medicine industry
- Will broaden the scope of future research

2011, XXI, 163 p.

Printed book

Hardcover

129,99 € | £109.99 | \$159.99

^[1]139,09 € (D) | 142,99 € (A) | CHF 153,50

Softcover

112,14 € | £84.99 | \$129.99

^[1]119,99 € (D) | 123,35 € (A) | CHF 132,50

eBook

93,08 € | £67.99 | \$99.00

^[2]93,08 € (D) | 93,08 € (A) | CHF 106,00

Available from your library or springer.com/shop

MyCopy ^[3]

Printed eBook for just

€ | \$ 24.99

springer.com/mycopy

A spherical actuator is a novel electric device that can achieve 2/3-DOF rotational motions in a single joint with electric power input. It has advantages such as compact structure, low mass/moment of inertia, fast response and non-singularities within the workspace. It has promising applications in robotics, automobile, manufacturing, medicine and aerospace industry. This is the first monograph that introduces the research on spherical actuators systematically. It broadens the scope of actuators from conventional single-axis to multi-axis, which will help both beginners and researchers to enhance their knowledge on electromagnetic actuators. Generic analytic modeling methods for magnetic field and torque output are developed, which can be applied to the development of other electromagnetic actuators. A parametric design methodology that allows fast analysis and design of spherical actuators for various applications is proposed. A novel non-contact high-precision 3-DOF spherical motion sensing methodology is developed and evaluated with experiments, which shows that it can achieve one order of magnitude higher precision than conventional methods. The technologies of nondimensionalization and normalization are introduced into magnetic field analysis the first time, and a benchmark database is established for the reference of other researches on spherical actuators.

Order online at springer.com / or for the Americas call (toll free) 1-800-SPRINGER / or email us at: customerservice@springernature.com. / For outside the Americas call +49 (0) 6221-345-4301 / or email us at: customerservice@springernature.com.

The first € price and the £ and \$ price are net prices, subject to local VAT. Prices indicated with [1] include VAT for books; the €(D) includes 7% for Germany, the €(A) includes 10% for Austria. Prices indicated with [2] include VAT for electronic products; 19% for Germany, 20% for Austria. All prices exclusive of carriage charges. Prices and other details are subject to change without notice. All errors and omissions excepted. [3] No discount for MyCopy.

