

# Curriculum Vitae



## Name

Yukio Takeda

## Current Position and Affiliation

Professor, Department of Mechanical Sciences and Engineering, Tokyo Institute of Technology, Japan

Director, Super-Mechano System Innovation & Development Center, Tokyo Institute of Technology, Japan

## Contact

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## Education

Bachelor of Engineering, Tokyo Institute of Technology, March 1987

Master of Engineering, Tokyo Institute of Technology, March 1989

Doctor of Engineering,

Thesis: Kinematic Synthesis of In-Parallel Actuated Manipulators with Consideration of Motion Transmissibility

Tokyo Institute of Technology, December 1995

## Professional Experience

1989-1996 Research Associate, Department of Mechanical Engineering and Science, Tokyo Institute of Technology

1996-2012 Associate Professor, Department of Mechanical Sciences and Engineering, Tokyo Institute of Technology

2000-2001 Visiting Scholar in Technical University of Munich and University of Florida

2002-2004 Program Officer, Ministry of Education, Culture, Sports, Science & Technology in Japan(while working in Tokyo Institute of Technology)

2012-present Professor, Department of Mechanical Sciences and Engineering, Tokyo Institute of Technology

2013-present Director, Super Mechano-System Innovation & Development Center, Tokyo Institute of Technology

## **Honors and Awards**

- 1995 Young Engineers Awards, Japan Society of Mechanical Engineers
- 2002 Best Paper Award of the 6th International Conference on Mechatronics Technology
- 2006 Outstanding Paper award, FANUC - FA Robot Foundation
- 2008 JSME Medal for Outstanding paper, The Japan Society of Mechanical Engineers
- 2010 Eiji Mutoh Excellent Design Award, The Japan Society for Design Engineering
- 2010 Distinguished Educator Award, The Japan Society for Design Engineering
- 2012 Distinguished Paper Award, Machine Design and Tribology Division, The Japan Society of Mechanical Engineers
- 2013 Highly Commended Paper Award, The 3<sup>rd</sup> IFToMM International Symposium on Robotics and Mechatronics (ISRM2013),

## **Academic Societies**

- The Japan Society of Mechanical Engineers,
- IFTToMM (International Federation for the Promotion of Mechanism and Machine Science)
- Robotics Society of Japan
- The Japan Society for Precision Engineering
- The Japan Society for Design Engineering

## **Research Interests:**

- Design of Mechanical Systems, Robotics, Kinematics, Mechanisms, Machine Elements, Welfare Machines, Kinematic Calibration, Dynamics, Motion Control

## **List of selected publications**

### **A. Kinematic, Static and Dynamic Analysis, Performance Evaluation and Synthesis of Mechanical Systems**

- (1) Yukio Takeda and Hiroaki Funabashi: Motion Transmissibility of In-Parallel Actuated Manipulators, JSME International Journal, Series C, Vol.38, No.4, 1995, pp.749-755.
- (2) Yukio Takeda and Hiroaki Funabashi: Kinematic and Static Characteristics of In-Parallel Actuated Manipulators at Singular Points and in Their Neighborhood, JSME International Journal, Series C, Vol.39, No. 1, 1996, pp.85-93.
- (3) Yukio Takeda, Hiroaki Funabashi and Yasutaka Sasaki: Development of a Spherical In-Parallel Actuated Mechanism with Three Degrees of Freedom with Large Working Space and High Motion Transmissibility (Evaluation of Motion Transmissibility and Analysis of Working Space), JSME International Journal, Series C, Vol. 39, No. 3, 1996, pp.541-548.
- (4) Yukio Takeda, Hiroaki Funabashi and Hironobu Ichimaru: Development of Spatial In-Parallel Actuated Manipulators with Six Degrees of Freedom with High Motion Transmissibility, JSME International Journal, Series C, Vol.40, No.2, 1997, pp.299-308.

- (5) Yukio Takeda and Hiroaki Funabashi: Kinematic Synthesis of In-Parallel Actuated Mechanisms Based on the Global Isotropy Index, *Journal of Robotics and Mechatronics*, Vol.11, No.5, 1999, pp.404-410.
- (6) Yukio Takeda and Hiroaki Funabashi: A Transmission Index for In-Parallel Wire-Driven Mechanisms, *JSME International Journal, Series C*, Vol. 44, No.1, 2001, pp.180-187.
- (7) Yukio Takeda: Kinematic Analysis of Parallel Mechanisms at Singular Points Where a Connecting Chain Has Local Mobility, *Mechanism and Machine Theory*, Vol.41, No.8, 2006, pp.945-957.
- (8) Yukio Takeda, Kouji Kamiyama, Yoshihisa Maki, Masaru Higuchi and Koichi Sugimoto: Development of Position-Orientation Decoupled Spatial In-Parallel Actuated Mechanisms with Six Degrees of Freedom, *Journal of Robotics and Mechatronics*, Vol.17, No.1, 2005, pp.59-68.
- (9) Syamsul Huda and Yukio Takeda: Kinematic Analysis and Synthesis of a 3-URU Pure Rotational Parallel Mechanism with Respect to Singularity and Workspace, *Journal of Advanced Mechanical Design, Systems, and Manufacturing*, Vol. 1, No. 1, 2007, pp. 81-92.
- (10) Syamsul Huda and Yukio Takeda: Kinematic Design of 3-URU Pure Rotational Parallel Mechanism with Consideration of Uncompensatable Error, *Journal of Advanced Mechanical Design, Systems, and Manufacturing*, Vol. 2, No. 5, 2008, pp. 874-886.
- (11) Masataka Tanabe, Yukio Takeda and Syamsul Huda: Utility Workspace of 3-5R Translational Parallel Mechanism, *Journal of Advanced Mechanical Design, Systems, and Manufacturing*, Vol. 2, No. 6, 2008, pp. 998-1010.
- (12) Masataka Tanabe and Yukio Takeda: Kinematic Design of a Translational Parallel Manipulator with Fine Adjustment of Platform Orientation, *Advances in Mechanical Engineering*, vol. 2010, Article ID 485358, 9 pages, 2010. doi:10.1155/2010/485358.
- (13) Yukio Takeda, Kazuki Ichikawa and Wei Guo: A Spatial Six-Dof Parallel Manipulator with Redundant Actuators for Gross and Fine Motions, *Journal of Advanced Mechanical Design, Systems, and Manufacturing*, Vol. 4, No. 2, , 2010, pp.444-456.
- (14) Yukio Takeda, Xiao Xiao, Kazuya Hirose, Yoshiki Yoshida and Ken Ichiryu: Kinematic Analysis and Design of 3-RPSR Parallel Mechanism with Triple Revolute Joints on the Base, *International Journal of Automation Technology*, Vol. 4, No. 4, 2010, pp. 346-354.
- (15) Syamsul Huda, Yukio Takeda and Shuta Hanagasaki: Kinematic Design of 3-URU Pure Rotational Parallel Mechanism to Perform Precise Motion within a Large Workspace, *Meccanica*, Vol. 46, 2011, pp. 89–100.
- (16) Keiji Yonemoto, Yukio Takeda, Zheng Tong and Masaru Higuchi: A New Flexure Revolute Joint with Leaf Springs and Its Application to Large Workspace Parallel Robot, *Journal of Advanced Mechanical Design, Systems, and Manufacturing*, Vol. 6, No.1, 2012, pp. 76-87.
- (17) Yukio TAKEDA, Satoshi INADA, Shohei KAWASUMI, Daisuke MATSUURA, Kazuya HIROSE, Ken ICHIRYU, Kinematic design of 3-RPSR parallel mechanism for movable-die drive mechanism of pipe bender, *ROMANIAN JOURNAL OF TECHNICAL SCIENCES APPLIED MECHANIC*, Vol. 58, pp. 71-96, 2013.
- (18) Yukio Takeda, Tsuyoshi Ikeda, Daisuke Matsuura, Spherical parallel mechanism with variable target point, *Computational Kinematics, Proceedings of 6<sup>th</sup> International Workshop on Computational*

Kinematics, pp. 155-163, 2013.

## **B. Kinematic Calibration and Control of Robots**

- (1) Yukio Takeda, Gang Shen and Hiroaki Funabashi: A DBB-Based Kinematic Calibration Method for In-Parallel Actuated Mechanisms Using a Fourier Series, Transactions of the ASME, Journal of Mechanical Design, Vol. 126, 2004, pp.856-865.
- (2) E. Castillo-Castaneda and Y. Takeda: Improving Path Accuracy of a Crank-type 6-dof Parallel Mechanism by Stiction Compensation, Mechanism and Machine Theory, Vol. 43, No.1, 2008, pp.104-114.
- (3) Eduardo Castillo-Castaneda, Daisuke Matsuura, Yukio Takeda, Circular test, positioning accuracy and repeatability of industrial robots using extrinsic parameters of a camera, Proc. 9<sup>th</sup> International Workshop on Robot Motion and Control, July 3-5, 2013, Wasowo Palace, Wasowo, Poland.
- (4) E. CASTILLO-CASTANEDA, Y. TAKEDA, S. KAWASUMI, D.MATSUURA, Pose estimation of a six degrees of freedom pipe-bender using a 3D-vision measurement system of high accuracy, Proc. of the 3<sup>rd</sup> IFToMM International Symposium on Robotics and Mechatronics (ISRM2013), 2013, pp. 799-808. doi: 10.3850/978-981-07-7744-9\_044

## **C. Characteristics Analysis of Human Motion and Development of Welfare Machines**

- (1) Yukio TAKEDA, Masaru HIGUCHI, Hiroaki FUNABASHI, Yoshinari OKI and Kazunori SHIMIZU, Development of a walking chair (Fundamental investigations for realizing a practical walking chair), Proc. 4th Int. Conf. on Climbing and Walking Robots (CLAWAR2001), Karlsruhe, Germany, 24-26 September 2001, pp.1037-1044.
- (2) Yukio Takeda, Gang Shen and Hiroaki Funabashi, Kinematic Calibration of In-Parallel Actuated Mechanisms by Means of Fourier Series, Proceedings of the First Taiwan-Japan Workshop on Mechanical and Aerospace Engineering, Dec. 19, 2001, pp.11-19.
- (3) Yukio Takeda, Hiroaki Funabashi and Masaru Higuchi : Walking Chair as a Welfare Robot, JSME News, 12-2(2001), pp.4-5.
- (4) Yunfeng Wu, Masaru Higuchi, Yukio Takeda and Koichi Sugimoto: Development of a Power Assist System of a Walking Chair (Proposition of the Speed-Torque Combination Power Assist System), Journal of Robotics and Mechatronics, Vol.17, No.2, 2005, pp.189-197.
- (5) Yunfeng Wu, Hitoshi Nakamura, Yukio Takeda, Masaru Higuchi and Koichi Sugimoto: Development of a Power Assist System of a Walking Chair Based on Human Arm Characteristics, Journal of Advanced Mechanical Design, Systems, and Manufacturing, Vol. 1, No. 1, 2007, pp. 141-154.
- (6) Daisuke Matsuura, Tatsuya Koga, Shota Ishida and Yukio Takeda, Kinetostatic Design of Ankle Rehabilitation Mechanism Capable of Adapting to Joint Axis Fluctuation, Journal of Robotics and Mechatronics, Vol. 25, No. 6, pp. 1029-1037.
- (7) Daisuke Matsuura, Ryuhei Funato, Makoto Ogata, Masaru Higuchi and Yukio Takeda, Efficiency Improvement of Walking Assist Machine Using Crutches Based on Gait-Feasible Region Analysis, Mechanism and Machine Theory, Special Issue: MMS2012, 2014(accepted).