

## Education

Ph.D. in Manufacturing Engineering, *Sapienza* University of Rome  
Ph.D. Thesis: Design and Construction of a MEMS-Based Multi DOF Planar Compliant Microrobot

M. S., Aerospace Engineering, *Sapienza* University of Rome

Clinical Engineering Division, Hospital Centre S. Giovanni–Addolorata, Rome  
Dissertation internship: Methods for surgical robots isotropy indexing and numerical simulations

## Experience

Postdoctoral fellow  
Department of Mechanical and Aerospace Engineering - *Sapienza* University of Rome  
Design and Construction of Microgrippers and MEMS-Based Compliant Microrobots

Postdoctoral fellow  
Agricultural Research Council – Agricultural Engineering Research Unit  
Satellite site specific crop management – Intra-field soil properties variability – Geostatistics  
Agro-energetic farming: Biogas and Molten Carbonate Fuel Cell System

Visiting research fellow  
Polytechnic Institute of New York University  
Smart Materials and Structures – Energy harvesting from base excitation of ionic polymer metal composites

## Awards

Best Research Paper Award  
N. P. Belfiore, M. Verotti, L. Consorti. Comparative Analysis of Isotropy Indices in RR and RRP Arms.  
*18<sup>th</sup> International Workshop on Robotics in Alpe-Adria Danube Region*, May 25-27, 2009, Brasov, Romania.

## Publications

### Journals

- 1 Verotti M. Analysis of the Center of Rotation in Primitive Flexures: Uniform Cantilever Beams with Constant Curvature. *Mechanism and Machine Theory*, Elsevier. Accepted for publication
- 2 Verotti M., Servadio P., Bergonzoli, S. Biogas Upgrading and Utilization from ICE towards Stationary Molten Carbonate Fuel Cell Systems. *International Journal of Green Energy*, Taylor & Francis. Accepted for publication (DOI:10.1080/15435075.2015.1018992)
- 3 Verotti M., Crescenzi, R., Balucani, M., Belfiore N. P. MEMS - based Conjugate Surfaces Flexure Hinge. *ASME Journal of Mechanical Design*, 137(1), 012301, 2015

- 4 Y. Cha, M. Verotti, H. Walcott, S. D. Peterson, M. Porfiri. Energy harvesting from the tail beating of a carangiform swimmer using ionic polymer metal composites. *Bioinspiration & Biomimetics*, Volume 8, Number 3, 2013
- 5 Belfiore N. P., Verotti M., Di Giamberardino P., Rudas I. J. Active Joint Stiffness Regulation to achieve Isotropic Compliance in Robots. *ASME Journal of Mechanisms and Robotics*, Volume 4, Issue 4, November 2012
- 6 Belfiore N. P., Di Giamberardino P., Rudas I. J., Verotti M. Isotropy in Any RR Planar Dyad under Active Joint Stiffness Regulation. *International Journal of Mechanics and Control*, Vol.12 N.1, pp. 75–82, 2011
- 7 Balucani M., Belfiore N. P., Crescenzi R., Verotti M.. The Development of a MEMS/NEMS-Based 3 D.O.F. Compliant Microrobot. *International Journal of Mechanics and Control*, Vol.12 N.1, pp. 3–10, 2011
- 8 Belfiore N. P., Scaccia M., Cappellani A., Verotti M. Direct Coupling of Robotic Hands or Prosthesis with the Radius Ulna Complex. *Ventil, Revija za Fluidno Tehniko, Avtomatizacija in Mehatroniko*, pp. 354–359, 16/2010/4
- 9 Belfiore N. P., Verotti M., Consorti L. Comparative Analysis of Isotropy Indices in RR and RRP Arms. *International Journal of Mechanics and Control*, Vol.11 N.1, pp. 3–12, 2010

## Book Chapter

- 1 Belfiore N. P., Berti U., Mondino A., Verotti M. A Comprehensive Evaluation of the Efficiency of an Integrated Biogas, Trigen, PV and Greenhouse Plant, Using Digraph Theory. *Studies in Computational Intelligence*, Volume 243, Towards Intelligent Engineering and Information Technology, pp. 595–605, Springer, 2009

## Conferences

- 1 Verotti M., Belfiore N. P. Isotropic Compliance in RRP Planar Manipulators. *IEEE 23rd International Conference on Robotics in Alpe-Adria-Danube Region. 3-5 September 2014, Smolenice, Slovakia*
- 2 Belfiore, N.P., Broggiato, G.B., Verotti M., Crescenzi R., Balucani B., Bagolini A, Bellutti P., Boscardin M. Development of a MEMS Technology CSFH based Microgripper. *IEEE 23rd International Conference on Robotics in Alpe-Adria-Danube Region. 3-5 September 2014, Smolenice, Slovakia*
- 3 Belfiore N. P., Verotti M., Ciavaglia F.. Optimal Joint Stiffness Regulation in Planar Robots for Packaging Operations. *Proceedings of the ASME 2014 12th Biennial Conference on Engineering Systems Design and Analysis (ESDA 2014). June 25-27, 2014, Copenhagen, Denmark*
- 4 Cha Y., Verotti M., Walcott H., Peterson S. D., Porfiri M. Energy harvesting from Base Excitation of a Biomimetic Fish Tail Hosting Ionic Polymer Metal Composites. *Proceedings of the ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems. September 16-18, 2013, Snowbird, Utah, USA*
- 5 Belfiore, N. P., Meibodi, M., Verotti M., Crescenzi R., Balucani, M., Nenzi, P., Balucani M. Kinetostatic Optimization of a MEMS-Based Compliant 3 DOF Plane Parallel Platform. *IEEE 9th International Conference on Computational Cybernetics. July 8-10, 2013, Tihany, Hungary*

- 6 Belfiore N. P., Verotti M., Sangiorgio S., Rubini L. Global Efficiency of an UPS Module Integrated with PV, H<sub>2</sub>, and CAES Systems. *IEEE International Conference on System Science and Engineering*. July 4-6, 2013, Budapest, Hungary
- 7 Belfiore N. P., Verotti M., Crescenzi R., Balucani M. Design, Optimization and Construction of MEMS-Based Micro Grippers for Cell Manipulation. *IEEE International Conference on System Science and Engineering*. July 4-6, 2013, Budapest, Hungary
- 8 Belfiore, N., Balucani, M., Cappellani, A., Meibodi, M., Crescenzi, R., Nenzi, P., Tamburrano, A., Mura, F., Verotti, M., and Kholostov, K., 2012. In quest of a reliable method of characterization of the mechanical properties of silicon micro-robots. *21th International Workshop on Robotics in Alpe-Adria-Danube Region*. 10-13 September 2012, Naples, Italy
- 9 Belfiore N. P., Balucani M., Crescenzi R., Verotti M.. Performance Analysis of Compliant High-Precision Parallel Robots through Pseudo-Rigid-Body Model Synthesis. *ASME 2012 - 11th Biennial Conference On Engineering Systems Design And Analysis (ESDA2012)*. July 2-4, 2012, Nantes, France
- 10 Belfiore N. P., Di Giamberardino P., Rudas I. J., Verotti M. Isotropy in Any RR Planar Dyad under Active Joint Stiffness Regulation. *IEEE 19<sup>th</sup> International Workshop on Robotics in Alpe-Adria-Danube Region (RAAD)*, 24-26 June, 2010, Budapest, Hungary (Selected to be published in *International Journal of Mechanics and Control*, Vol.12 N.1, pp. 75-82, 2011)
- 11 Verotti M., Cappa F., Crescenzi R., Belfiore N. P., Balucani M. Construction and Experimental Simulation of a Tethered MEMS-Based 3 DOF Silicon Microrobot. *20th International Workshop on Robotics in Alpe-Adria-Danube Region (RAAD)*, October 5-7, 2011, Brno, Czech Republic
- 12 Balucani M., Belfiore N.P., Crescenzi R., Genua M., Verotti M.. Developing and Modeling a plane 3 DOF Compliant Micromanipulator by means of a dedicated MBS code. *Proceedings of Nanotech 2011*, Vol. 2, pp. 659-662, June 13-16, 2011, Boston, MA
- 13 Balucani M., Belfiore N. P., Crescenzi R., Verotti M. The Development of a MEMS/NEMS-Based 3 D.O.F. Compliant Microrobot. *IEEE 19th International Workshop on Robotics in Alpe-Adria-Danube Region (RAAD)*, pp. 173 - 179, June 24-26, 2010, Budapest, Hungary. (Selected to be published in *International Journal of Mechanics and Control*, Vol.12 N.1, pp. 3-10, 2011)
- 14 Belfiore N. P., Scaccia M., Cappellani A., Verotti M. Direct Coupling of Robotic Hands or Prosthesis with the Radius Ulna Complex. *18th International Workshop on Robotics in Alpe-Adria-Danube Region (RAAD)*, May 25-27, 2009, Brasov, Romania. (Selected to be published in *Ventil, Revija za Fluidno Tehniko, Avtomatizacija in Mehatroniko*, pp. 354-359, 16/2010/4)
- 15 Belfiore N. P., Verotti M., Consorti L. Comparative Analysis of Isotropy Indices in RR and RRP Arms. *18th International Workshop on Robotics in Alpe-Adria-Danube Region (RAAD)*, May 25-27, 2009, Brasov, Romania. (Selected to be published in *International Journal of Mechanics and Control*, Vol.11 N.1, pp. 3-12, 2010)
- 16 Belfiore N. P., Bolognesi G., Verotti M., Scaccia M., Cappa F., D'Annibale A., Lazzari S., Rudas I. J. Methods for Surgical Serial Manipulators Isotropy Indexing. *17th International Workshop on Robotics in Alpe-Adria-Danube Region*, September 15-17 2008, Ancona, Italy

## Abstract

- 1 Verotti M., Servadio P., Belfiore N.P., Bergonzoli,S. An Approach to Modeling the Influence of Wheel Tractor Loads and Vibration Frequencies on Soil Compaction. *Geophysical Research Abstract*, Vol.14, EGU 2012