

# S.M.Hadi Sadati, Ph.D.

Postdoc Research Associate in Robotic Systems Engineering  
[Robotics and Vision in Medicine \(RViM\) Lab](#)

Website: [www.smh-sadati.com](http://www.smh-sadati.com)  
Contact: [smh\\_sadati@kcl.ac.uk](mailto:smh_sadati@kcl.ac.uk)

Dep. Surgical & Interventional Engineering, King's College London, UK.

## Education

---

**King's College London, UK** **2014-18**

PhD in Robotics, School of Mathematics and Natural Science, Department of Informatics  
Thesis: Decentralized Morphological Stiffness Tunable Interface for Continuum Manipulators  
Main supervisors: Dr. Thrishantha Nanayakkara

**Sharif University of Technology, Tehran, Iran** **2010-12**

M.Sc. in Mechanical Engineering, Applied Design, School of Mechanical Engineering  
Thesis: Modeling, Design and Simulation of Falling and Landing Process in a Robotic Cat  
Supervisor: Prof. Ali Meghdari

**Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran** **2005-10**

B.Sc. in Mechanical Engineering, School of Mechanical Engineering  
Thesis: Design and Build of a Passive Walking Biped, Main supervisors: Dr. Mahyar Naraghi

## Research Interests

---

**Soft Robotics:** Medical Robotics, Bio-inspiration, Variable Stiffness, Mechatronics Design, 3D Printing

**Medical Robotics:** Continuum Medical Robotics, Tooltip Design, Biomechanic System Modeling, Medical Robotic Phantoms, Planning & Automation in Medical Interventions

**Morphological Contribution:** Functional Morphologies, Morphological Observers, Decentralized Control

**Dynamics & Planning:** Continuum Dynamics, Dynamical System Approach to Planning & Automation, Bond Graph Multi-Physics Modeling, Domain-Specific Language for Robotics, Passive Dynamics

## Research Positions & Visits

---

### Positions

**Postdoctoral Research Associate in Robotics System Engineering** **May 2019-present**

Robotics and Vision in Medicine (RViM) Lab, Dept. Surgical and Interventional Engineering, School of Biomedical Engineering and Imaging Science, King's College London, London, UK.

Topic: ERC PIONEER- Peri-Ocularly Navigated Exteroceptive Snake Robot for Novel Retinal Interventions

Supervisor: Dr. Christos Bergeles

**Postdoctoral Research Associate in Morphological Computation with Spiders' Web** **Nov 2017-Apr 2019**

Dep. of Electrical and Electronic Engineering, University of Bristol, Bristol, UK.

Title: Leverhulme Trust Project: Computing with spiders' webs – An inspiration for new sensors and robots

Supervisor: Dr. Helmut Hauser robots

**R&D Team Member & Manager** **2006-10**  
ASAME (Pasargad) Robotic Club, Department of Mechanical Engineering, Amirkabir U.T., Tehran, Iran.  
Title: Real Rescue Robot Design Equipped with Serial-link Robotic Manipulators, Supervisor: Dr. M. R. Razfar

## Visits

**Visiting researcher**, Learning Algorithms and Systems Laboratory (LASA), EPFL, Switzerland. **Nov-Dec 2019**  
Title: DS-based robust path-planning and control of a Concentric Tube Robot (CTR)  
Supervisor: Prof. Aude Billard

**Visiting PhD Student**, Dyson School of Design Engineering, Imperial College London, UK. **Jun 2017- Oct 2018**  
Title: Bio-inspired Jamming interface for Stiffness Controllable Continuum Manipulators  
Supervisor: Dr. Thrishantha Nanayakkara

**Visiting Scholar**, Dep. of Electrical and Computer Eng., Clemson University, Clemson, SC, USA. **Nov 2017**  
Title: Real-time Path-Planning and Dynamic Control of Long Continuum Manipulators.  
Supervisor: Prof. Ian D. Walker

## Industry

**R&D Manager**, Kaveh Sanaat-e Sharif Company, Tehran, Iran. **2013**  
Title: Design and fabrication of a Real Rescue Robot with 5-DOF Manipulator. Supervisor: Mr. A. Torabi Parizi

**R&D Engineer**, Mangan Industrial Group, Tehran, Iran. **2011- Mar 2012**  
Title: Analysis and Optimization of Type “A” Off-shore Crane Boom” and “Lead and Profile Modification of a High-Speed Helical Gears”. Supervisors: Mr. A. Ghasimi, Mr. M. A. Abbaspour

**Consultant**, Tarbiat Modares University, Tehran, Iran. **2010**  
Mechanical Design of a 4-DOF Arm Manipulator. Supervisor: Ms. Z. Mohammadi

## Honors & Awards

---

### Grants

**King's Global Engagement Partnership Fund**, £10.5K, PI **2020-21**  
“Dynamical System (DS) Approach for Continuum Medical Robotics Planning & Control”, a joint research by Robotics and Vision in Medicine Lab (RViM), King’s College London, and Learning Algorithms and Systems Laboratory (LASA), École 2Polytechnique Fédérale de Lausanne (EPFL).

**EPSRC**, £1m, Co-I (**Under preparation**) **2021-22**  
“A Data Driven Approach to Reduce Ventilator-Induced Lung Injury (VILI)” by Imperial College London, King’s College London, Oxford University, National Heart & Lung Institute, Guy’s & St Thomas' Hospital

## Scholarships & Fellowships

**RAEng Research Fellowship Scheme**, (**University shortlisted for final submission**) **2021-26**  
“Reinventing Catheter Steering by Soft Robotics: A Tele-Supervised Semi-Autonomous Wound-Free Robotic Thrombectomy in Acute Stroke (ART)” hosted by King’s College London

Graduate Teaching Scholar (GTS), PhD study at King’s College London, London, UK - £68K + Tuition **2014-17**  
Tuition free MSc (Sharif U.T., Iran) & BSc (Amirkabir U.T., Iran) studies **2005-2012**

## Travel Grants

Visiting research support, LASA, EPFL, Switzerland – 2K CHF	2019
IEEE Summer School on Control of Surgical Robots (COSUR) travel award, Livorno, Italy - €500	2016
ASME DSCC conference travel grant, Ohio, US - \$200	2015
Conference travel fund, Dept. of Informatics, King's College London, UK - 3 x £500	2015-17

## Publication Awards

Excellent Oral Presentation, IEEE ICMAE conference, Prague, Czech Republic.	2017
Best Student Paper Award, IEEE ICIAFS conference, Sri Lanka, Sri Lanka.	2013
Distinguished BSc thesis finalist, Amirkabir U.T., Tehran, Iran.	2010

## National Qualification Exams

Rank 14 <sup>th</sup> among 2K (Top 0.7%), PhD qualification exam in Mechanical Eng. Control & Vibration, Iran	2012
Rank 17 <sup>th</sup> among 10K (Top 0.2%), MSc qualification exam in Mechanical Engineering, Iran	2010
Rank 697 <sup>th</sup> among 300K (Top 0.2%), BSc qualification exam in Math, Iran	2005

## Selected Publications

- 
- S.M.H. Sadati**, et al., "TMTDyn: A Matlab Package for Modeling and Control of Hybrid Rigid-Continuum Robots Based on Discretized Lumped System and Reduced Order Models." *IJRR* **2020**
- S.M.H. Sadati**, et al., "Real-time Shape and Tip Force Estimation of a Continuum Appendage from Base Load Readings: A Stiffness Imaging Application", *IEEE RA-L* **2020**
- Z. Mitros, **S.M.H. Sadati**, et al., "Optic Nerve Sheath Fenestration with a Multi-Arm Continuum Robot", *IEEE RA-L* **2020**
- Kayode Sonaïke and **S.M.Hadi Sadati**, et al., "Exploiting the Morphology of a Shape Memory Spring as the Active Backbone of a Highly Dexterous Tendril Robot (ATBR)", *IROS* **2020**
- A. Shiva, **S.M.H. Sadati**, et al., "Elasticity vs. Hyperelasticity Considerations in Quasi-Static Model for Real-time Position & Force Estimation of a Soft Manipulator." *SoRo* **2019**
- S. Abad, N. Herzig, **S.M.H. Sadati**, and T. Nanayakkara., "The dynamics of a Bioinspired Hoof on the Slip Reduction." *IEEE T-RO* **2019**
- H. Wegiriya, N. Herzig, S. Abad, **S.M.H. Sadati** and T. Nanayakkara., "Information Gain in a Stiffness Controllable Multimodal Whisker Follicle." *IEEE Sensors* **2019**
- S.M.H. Sadati**, W. Thomas, "Toward Computing with Spider Webs: Computational Setup Realization", *LM Conference* **2018**
- S.M.H. Sadati**, et al., "Three-Dimensional-Printable Thermoactive Helical Interface with Decentralized Morphological Stiffness Control for Continuum Manipulators", *IEEE RA-L* **2018**
- S.M.H. Sadat**, et al., "Control Space Reduction and Real-Time Accurate Modeling of Continuum Manipulators Using Ritz and Ritz-Galerkin Methods", *IEEE RA-L* **2018**
- S.M.H. Sadati**, et al. "A geometry deformation model for braided continuum manipulators." *Frontiers in Robotics and AI* **2017**
- S.M.H. Sadati**, et al., "Continuum Manipulators Mechanics, A Comparative Study of Six Methods with Experiments", *TAROS* **2017**
- S.M.H. Sadati**, et al., "Stiffness Control of Soft Robotic Manipulator for Minimally Invasive Surgery (MIS) Using Scale Jamming". *ICIRA* **2015**

## Research Experiences

---

### Continuum Manipulator Modeling

2014-present

Positions: Postdocs at [RViM Lab](#) (King's College London, UK) and Morphological Computation Lab (University of Bristol, UK), PhD at [Morph Lab](#) (King's College London and Imperial College London, UK), Visit at [Prof. Walker's Lab](#) (Clemson University, US)

Main collaborators: Prof. Ian Walker, Dr. Christos Bergeles, Dr. Caleb Rucker

Summary: We presented novel dynamic and static models for continuum manipulators based on reduced-order and discretization approaches suitable for controller and observer design. We have presented a unified theoretical framework, comparison of accuracy in experimental studies, and numerical performance for different methods showing the superiority of our approaches. We developed [TMTDyn](#) modeling package equipped with a DSL for modelling and control of hybrid rigid-continuum structures.

### Robots Planning, Control, and Automation

2019-present

Positions: Postdoc at [RViM Lab](#) (King's College London, UK), Visit at [LASA](#) (EPFL, Switzerland), MSc at [CEDRA](#) (Sharif. U.T., Iran)

Main collaborators: Prof. Aude Billard, Dr. Christos Bergeles, Prof. Ali Meghdari

Summary: We have recently focused on transferring Dynamical System (DS) approach for planning and automation in continuum medical robotics. DS method generates streamline-like paths for task execution that inherently guarantees global convergence, stability, temporal and spatial robustness. I have a 5-year RAEng under review fellowship application on the same topic currently and have done research on active constraint-based medical robot control with [SOFA modeling framework](#) (safe medical robotic navigation via haptic feedback) and shooting-based planning method for non-holonomic dynamical systems (the case of a robotic cat free fall).

### Medical Robotics Theory, Design & Fabrication

2014-present

Positions: Postdoc at [RViM Lab](#) (King's College London, UK), PhD at [Morph Lab](#) (King's College London and Imperial College London, UK)

Main collaborators: Dr. Christos Bergeles, Dr. Kaspar Althoefer, Dr. Thrishantha Nanayakkara

Summary: I have been active in development and fabrication of medical robot-related theory and technologies since my PhD studies, some of which are: stiffening solutions; tissue palpation; concentric tube robots, ex-vivo real tissue tests; DS and active constraint-based planning; robotic phantoms; and more recently patient-specific biomedical modelling (EIT image-based respiratory system model), and miniature medical sensor and multi-purpose tooltip designs.

### Bioinspiration, Morphological Contribution, Smart Material

2010-present

Positions: Postdoc at [RViM Lab](#) (King's College London, UK), Postdoc at [Morphological Computation lab](#) (University of Bristol, UK), PhD at [Morph Lab](#) (King's College London and Imperial College London, UK)

Main collaborators: Dr. Thrishantha Nanayakkara, Dr. Helmut Hauser, Dr. Christos Bergeles

Summary: Bioinspiration has been a main theme in my research, not only as a source of inspiration but for discovering new biological mechanisms via robotic design. As a result, I actively pursue morphological contribution, to outsource control tasks to the robot morphology, in my designs via functional structures with smart material, bi-modal multi-purpose mechanisms, and distributed actuation and control methods. Some of my relevant research are spider-web like sensors, active Velcro and tendrils, 3D-printable scale jamming stiffening interfaces, compliant structures for palpation, whisking, and sleep resistance, and recently growing medical cannulas.

## System Dynamics

2009-present

Positions: Postdoc at [RViM Lab](#) (King's College London, UK), Visit at [LASA](#) (EPFL, Switzerland), Visit at [Prof. Walker's Lab](#) (Clemson University, US), PhD at [Morph Lab](#) (King's College London and Imperial College London, UK), MSc at [CEDRA](#) (Sharif. U.T., Iran), BSc and industrial experiences

Main collaborators: Dr. Christos Bergeles, Prof. Ian Walker, Prof. Aude Billard, Dr. Caleb Rucker, Dr. Helmut Hauser, Dr. Thrishantha Nanayakkara, Prof. Ali Meghdari, Dr. Mahyar Naraghi

Summary: I am an expert dynamic system modeler, approaching all my research from a model-based point of view. I have extensive experience with modeling of multi-physics biomedical and continuum systems (e.g. patient-specific respiratory system), hybrid continuum-rigid body system models (resulted in the development of TMTDyn package), DS-based planning for automation, passive dynamics, and nonholonomic system planning (the case of falling a cat robot).

## Mechatronic System Design, Optimization, & Fabrication

2006-present

Positions: Postdoc at [RViM Lab](#) (King's College London, UK), PhD at [Morph Lab](#) (King's College London and Imperial College London, UK), BSc and industrial experiences

Main collaborators: Dr. Christos Bergeles, Dr. Thrishantha Nanayakkara, Dr. Mahyar Naraghi

Summary: I am an expert in robotic and mechatronic system engineering design, optimization, and fabrication. Model-based optimization of the system performance and engineering design of system elements are two key steps in my approach. Some of my robot design are multiple real rescue robots equipped with long series link manipulators, concentric tube and active backbone continuum robots, soft robotics actuator and stiffening mechanisms, robotic vibration and deformable boundary phantom testing platforms, 3D printing functional structures, passive biped walkers and a cat robot.

## Computer Science & Programming

2014-present

Positions: Postdoc at [RViM Lab](#) (King's College London, UK), PhD at [Morph Lab](#) (King's College London and Imperial College London, UK)

Main collaborators: Dr. Steffen Zschaler, Dr. Christos Bergeles, Dr. Thrishantha Nanayakkara

Summary: I have extensive experience in different programming languages (with more than 900hr GTS teaching experience) such as Matlab, Maple, C++, Java, Python, Prolog, Assembly, in SOFA, ROS, and Linux environments. We have an ongoing project on developing TMTDyn modeling and control package for hybrid rigid-continuum body structures and a DSL (Distributed System Language) based user interface.

## Teaching & Supervision Experiences

---

### Lectures

**Lecture**, Dept. of Imaging and Biomedical Science, King's College London, UK **2020-21**

Subject: "[Mechanics for Biomedical Engineering](#)" 3<sup>rd</sup>-year undergraduate course (40% – 16 Hrs)

**Lecture**, Dept. of Imaging and Biomedical Science, King's College London, UK **2020-21**

Subject: "[Advanced Mechanics](#)" 1<sup>st</sup>-year undergraduate course (60% – 24 Hrs, 81 students)

### Supervision

"[Active Constraints for Surgical Robot using SOFA](#)", M. D. I. Reyzaal, MSc, King's College London, UK **2020**

"[Shape Memory Tendril Backbone Continuum Manipulator](#)", O. Sonaike, MSc, University of Bristol, UK **2019**

"[Spiderman Web Shooter](#)", R. Wang, MSc, University of Bristol, UK **2019**

"[Spider Web Inspired Soft Tactile Sensor Network](#)", S. P. Patni, MSc, University of Bristol, UK **2019**

<b>"A Robotic Cat Free-Fall"</b> , Z. Chen, MSc, University of Bristol, UK	<b>2018</b>
<b>"Robotic Cat Free Fall: A Design to Imitate Cat-Like Roll"</b> , S. Liang, MSc, University of Bristol, UK	<b>2018</b>
<b>"Electro-Active SMA Velcro Mechanism"</b> , H. Afrisal, MSc, King's College London, UK	<b>2016</b>
<b>"A Variable Stiffness Smart Hydrogel"</b> , D. G. Mosquera, MSc, King's College London, UK	<b>2016</b>
<b>"Low Melting Point Alloy Variable Stiffness Structures"</b> , A. Gupta, MSc, King's College London, UK	<b>2016</b>
<b>"3D-Printable Thermoactive Stiffening Helical Interface"</b> , L. Sullivan, MSc, King's College London, UK	<b>2016</b>
<b>"Elastomer Graphene Electrodes via Laser Scribing"</b> , MSc, King's College London, UK	<b>2016</b>
<b>"Piezo Electric Micro Force Sensor for Surgical Robot Tooltip"</b> , J. ROwell, BSc, King's College London	<b>2021</b>
<b>"Active Tendril Backbone Robot (ATBR) for Laparoscopy"</b> , E. Kanani, BSc, King's College London, UK	<b>2021</b>
<b>"Miniature Suction Cup Gripper for Surgical Robot Tooltip"</b> K. Joymungul, BSc, King's College London	<b>2021</b>
<b>"Bath Robot with Anisotropic Stiffness Wings"</b> , P. Ghalamchi, BSc ( <b>Best Thesis Award</b> ), King's College London, UK	<b>2014</b>

## Teaching Assistantship

<b>Teaching Assistant</b> , Department of Imaging and Biomedical Science, King's College London, UK	<b>2019</b>
1 subject: " <a href="#">Medical Robotics: Theory and Applications</a> " postgraduate courses (6 hours)	
<b>Graduate Teaching Scholar</b> , Informatics Department, King's College London, UK	<b>2014-17</b>
11 subjects: "Practical Experiences of Programming", "Software Engineering Group Project", "Introduction to Robotics", "Computer Systems I", "Programming Practice", "Real-time Systems", "BSc & MSc Individual Projects", "Adaptive and Robotic Systems", "Elementary Logic and Applications", "Foundation of Computing I" and "Data Structures" postgraduate & undergraduate courses (about 900 hours, 204hr a year)	

## Professional Activities & Affiliations

<b>Review Editor</b> in <b>Bio-Inspired Robotics</b> , Frontiers in Robotics and AI Journal	<b>2020-present</b>
<b>Special Issue Editor</b> , Frontiers in Robotics and AI Journal	<b>2018-19</b>
Title: <a href="#">Research Topic- Current Advances in Soft Robotics: Best Papers from RoboSoft 2018</a>	
<b>Organizing Member</b> of IEEE RAS Soft Robotics <a href="#">Newsletter &amp; Debates</a>	<b>2015-present</b>
<b>Reviewer</b> for 37 scientific journal and 25 conference publications excluding revisions	<b>2015-present</b>
Journals: IJRR (3), T-RO (4), SoRo (4), RAM (2), RA-L (16), TMech, Frontiers, JIRS, JRM, JINT, JMES, MDPI. Conferences: ICRA, IROS, RoboSoft, ICORR, ICRoM, ICIAfS	
<b>Regular &amp; Student Member</b> , IEEE RAS & ASME	<b>2014- present</b>

## Professional Trainings & Certificates

### Technical

<b>Summer school on Control of Surgical Robots (COSUR)</b> , Livorno, Italy. (1 week)	<b>2016</b>
<b>DOE (Design of Experiments)</b> , TUV INTERCERT International Certification, Iran. (20hr)	<b>2011</b>

### Teaching

<b>Enhanced Certificate for Child Workforce Student Ambassador</b> , King's College London, UK	<b>2014</b>
--	-------------

## Software & Programming Skills

MATLAB, Maple, Latex, SolidWorks, Autocad, Ansys Workbench, Comsol, MSC.ADAMS, SOFA, Webots, WorkingModel, ROS, LabView, KissSoft, GearTrax, 20-Sim, MATLAB, C++, Java, Python, Prolog, Assembly

## Personal Information

---

**Age:** 33, **Gender:** Male, **Nationality:** Iranian

**Hobbies:** traveling, cycling, reading.

**Languages:** Persian (Native), English (PhD studies & Postdoc experiences), Arabic (6 years of school courses)

## References

---

**Prof. Ian D. Walker**, Prof. in Robotics, Clemson University, Clemson, SC, USA. [iwalker@clemson.edu](mailto:iwalker@clemson.edu)

**Dr. Christos Bergeles**, Senior Lecturer in robotics, King's College London, UK. [christos.bergeles@kcl.ac.uk](mailto:christos.bergeles@kcl.ac.uk)

**Dr. Thrishantha Nanayakkara**, Reader in Robotics, Imperial College London, UK. [t.nanayakkara@imperial.ac.uk](mailto:t.nanayakkara@imperial.ac.uk)

**Prof. Kaspar Althoefer**, Prof. in Robotics, Queen Mary University of London, UK. [k.althoefer@qmul.ac.uk](mailto:k.althoefer@qmul.ac.uk)

## Publications List

---

### Journal Articles

- **S.M.H. Sadati**, S. E. Naghibi, L. da Cruz, C. Bergeles, "Reduced-Order Modeling and Model Order Reduction for Soft Robots: A Review", *Soft Robotics* (under review)

- P. Berthet-Rayne, **S.M.H. Sadati**, N. Patel, S. Giannarou, D. R. Leff, C. Bergeles, "MAMMOBOT: A Miniature Steerable Soft Growing Robot for Early Breast Cancer Detection", *IEEE Robotics and Automation Letter* and IEEE International Conference on Robotics and Automation (ICRA) (under review)

[1] **S.M.H. Sadati**, S. E. Naghibi, A. Shiva, S. Zschaler, C. Rucker, M. Brendan, L. Renson, K. Althoefer, T. Nanayakkara, H. Hauser and I. Walker., "TMTDyn: A Matlab Package for Modeling and Control of Hybrid Rigid-Continuum Robots Based on Discretized Lumped System and Reduced Order Models." *International Journal of Robotics Research (IJRR)*, 2020

[2] **S.M.H. Sadati**, A. Shiva, S. E. Naghibi, C. Rucker, C. Bergeles, I. Walker, H. Hauser, K. Althoefer and T. Nanayakkara., "Real-time Shape and Tip Force Estimation of a Continuum Appendage from Base Load Readings: A Stiffness Imaging Application", *IEEE Robotics & Automation Letters (RA-L)* and IEEE International Conference on Robotics and Automation (ICRA), 2020

[3] Z. Mitros, **S.M.H. Sadati**, C. Seneci, E. Bloch, K. Leibbrandt, M. Khadem, L da Cruz, C. Bergeles, "Optic Nerve Sheath Fenestration with a Multi-Arm Continuum Robot", *IEEE Robotics and Automation Letters (RA-L)* and IEEE International Conference on Intelligent Robots and Systems (IROS), 2020

[4] A. Shiva, **S.M.H. Sadati**, Y. Noh, J. Fras, A. Ataka, H. Wurdemann, H. Hauser, I. D. Walker, T. Nanayakkara, K. Althoefer., "Elasticity vs. Hyperelasticity Considerations in Quasi-Static Model for Real-time Position & Force Estimation of a Soft Manipulator." *Soft Robotics (SoRo)*, 2019

[5] Sara-Adela Abad, Nicolas Herzig, **S.M.Hadi Sadati**, and Thrishantha Nanayakkara., "The dynamics of a Bioinspired Hoof on the Slip Reduction." *IEEE Transaction on Robotics (T-RO)*, 2019

[6] Hasitha Wegiriya, Nicolas Herzig, Sara-Adela Abad, **S.M.Hadi Sadati** and Thishantha Nanayakkara., "Information Gain in a Stiffness Controllable Multimodal Whisker Follicle." *IEEE Sensors*, 2019

[7] **S.M.H. Sadati**, S. E. Naghibi, A. Shiva, Y. Noh, A. Gupta, I. D. Walker, K. Althoefer, T. Nanayakkara, "Three-Dimensional-Printable Thermoactive Helical Interface with Decentralized Morphological Stiffness Control for Continuum Manipulators", *IEEE Robotics & Automation Letters (RA-L)* and IEEE International Conference on Robotics and Automation (ICRA), 2018

[8] **S.M.H. Sadat**, S. E. Naghibi, I. D. Walker, K. Althoefer, T. Nanayakkara, "Control Space Reduction and Real-Time Accurate Modeling of Continuum Manipulators Using Ritz and Ritz-Galerkin Methods", *IEEE Robotics and Automation Letters*, 2018

[9] S. E. Naghibi, S. Karabasov, M. A. Jalali, **S.M.H. Sadati**, "Fast spectral solutions of the double-gyre problem in a turbulent flow regime." *Applied Mathematical Modelling*, 2018

[10] **S.M.Hadi Sadati**, S. Elnaz Naghibi, Ali Shiva, Yohan Noh, Aditya Gupta, Ian D. Walker, Kaspar Althoefer, Thrishantha Nanayakkara. "A geometry deformation model for braided continuum manipulators." *Frontiers in Robotics and AI*, 2017

[11] **S.M.Hadi Sadati**, M. Naraghi, A. R. Ohadi Hamedani; "Optimum Design, Build and Experiment of a Passive Walking Biped: Effects of Structural Parameters on Efficiency, Stability and Robustness on Uneven Trains." *Modares Mechanical Engineering Journal*, vol. 12, No. 6, pp. 52-68 (in Persian), 2012

### Editorial & Spotlight Articles

[12] **S.M.Hadi Sadati**, Perla Maiolino, Fumiya Iida, Thrishantha Nanayakkara and Helmut Hauser, "Editorial: Current Advances in Soft Robotics - Best Papers from RoboSoft 2018", *Frontiers in Robotics and AI*, 2020



[13] S. G. Nurzaman, **S.M.H. Sadati**, M. Eldiwiny, F. Iida, "TC Spotlight: Soft Robotics: The Journey Thus Far and the Challenges Ahead", TC Spotlight, *IEEE Robotics and Automation Magazine*, 2020 (under print)

## Book Chapter

[14] D Guevara Mosquera, **S.M.H. Sadati**, KA Althoefer, T Nanayakkara, "Smart Hydrogel for Stiffness Controllable Continuum Manipulators: A Conceptual Design", Soft and Stiffness-controllable Robotics Solutions for Minimally Invasive Surgery: The STIFFFLOP Approach, *River Publishers Series in Automation, Control and Robotics*, Denmark, ISBN: 9788793519725, 2018

## Patent

- P. Berthet-Rayne, **S.M.H. Sadati**, C. Bergeles, "Everting Medical Device", UK Patent, (under review)

## Workshop Proposal

[15] T. G. Thuruthel, C. Della Santina, **S.M.H. Sadati**, F. Renda, C. Laschi, "[Application-Oriented Modelling and Control of Soft Robots](#)", *IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2020

## Peer-Reviewed Conference Articles

- **S.M.H. Sadati**, Z. Mitros, R. Henry, L. da Cruz, C. Bergeles, "Reduced-Order Real-Time Dynamics of Concentric Tube Robots: A Polynomial Shape (PS) Parametrization", *IEEE International Conference on Robotics and Automation (ICRA)* (under review)

[16] Kayode Sonaike and **S.M.Hadi Sadati**, Christos Bergeles, Ian D. Walker, "Exploiting the Morphology of a Shape Memory Spring as the Active Backbone of a Highly Dexterous Tendril Robot (ATBR)", *IEEE International Conference on Intelligent Robots and Systems (IROS)*, 2020

[17] **S.M.Hadi Sadati**, Steffen Zschaler, Christos Bergeles, "A Matlab-Internal DSL for Modelling Hybrid Rigid-Continuum Robots with TMTDyn.", *6th Workshop on Model-Driven Robot Software Engineering (MORSE)* Munich, Germany, 2019

[18] **S.M.H. Sadati**, A. Shiva, S. E. Naghibi, C. Rucker, C. Bergeles, L. Renson, K. Althoefer, T. Nanayakkara, H. Hauser and I. Walker., "Reduced Order vs. Discretized Lumped System Models for Continuum Manipulators: New Methods and a Comparative Study Based on Experiments." *Robotics, Science and Systems (RSS)* Conference, Freiburg, Germany, 2019

[19] **S.M.H. Sadati**, W Thomas, "Toward Computing with Spider Webs: Computational Setup Realization", *Living Machines Conference (LM 2018)*, Paris, France, 2018

[20] **S.M.H. Sadati**, S. E. Naghibi, K. Althoefer, T. Nanayakkara, "Toward a Low Hysteresis Helical Scale Jamming Interface Inspired by Teleost Fish Scale Morphology and Arrangement", *IEEE International Conference on Soft Robotics (RoboSoft)*, Livorno, Italy, 2018

[21] **S.M.H. Sadati**, A. Meghdari, "Singularity-Free Planning for a Robot Cat Free-Fall with Control Delay: Role of Limbs and Tail", *IEEE Int. Conference on Mechanical and Aerospace Engineering (ICMAE)*, 2017 - *Winner of Excellent Oral Presentation Award in Robot System Design and Control Session*

[22] **S.M.H. Sadati**, S. E. Naghibi, A. Shiva, I. D. Walker, K. Althoefer, T. Nanayakkara, "Continuum Manipulators Mechanics, A Comparative Study of Six Methods with Experiments", *18th Towards Autonomous Robotic Systems (TAROS)*, 2017

[23] H. Afrisal and **S.M.H. Sadati**, T. Nanayakkara, "A Bio-Inspired Electro-Active Velcro Mechanism Using Shape Memory Alloy for Wearable and Stiffness Controllable Layers", *Information and Automation for Sustainability (ICIAfS)*, 9th Intl. Conf. on IEEE, 2016

- [24] **S.M.H. Sadati**, A. Shiva, A. Ataka, S. E. Naghibi, I. D Walker, K. Althoefer, T. Nanayakkara, "A Geometry Deformation Model for Compound Continuum Manipulators with External Loading", *IEEE Int. Conference on Robotics and Automation (ICRA)*, 2016
- [25] **S.M.H. Sadati**, Y. Noh, S. E. Naghibi, K. Althoefer, T. Nanayakkara, "Stiffness Control of Soft Robotic Manipulator for Minimally Invasive Surgery (MIS) Using Scale Jamming". *Intelligent Robotics and Applications, 8th International Conference (ICIRA)*, Portsmouth, UK, Springer, 2015
- [26] **S.M.H. Sadati**, S. E. Naghibi, M. Naraghi. "An Automatic Algorithm to Derive Linear Vector Form of Lagrangian Equation of Motion with Collision and Constraint." *Procedia Computer Sci.* 76:217-222., 2015
- [27] M. Zheng, **S.M.H. Sadati**, P. Ghalamchi, T. Nanayakkara, "Passive dynamics of high frequency bat wing flapping with an anisotropic membrane." *Information and Automation for Sustainability (ICIAfs), 7th Int. Conf. on IEEE, 2014 - Winner of Best Student Paper Award*
- [28] **S.M.H. Sadati**, M. Ghasimi, M. A. Abbaspour, "Analysis, Modeling, and Optimization of Tooth Modification in High Speed Helical Gears", *5th Annual Conference on Rotating Equipment in Oil and Power Industries, Rotating Equipment*, Tehran, Iran, January 21-22, (Poster presentation, in Persian), 2014
- [29] Ali Meghdari, **S.M.Hadi Sadati**, " Cat Landing on Rigid and Flexible Surfaces: Semi-Flat Multi Impact Modeling and Path Planning in Presence of Constraints." *Advances in Nano, Biomechanics, Robotics, and Energy Research (ANBRE13)*, Int'l Assoc. of Structural Engineering & Mechanics (IASSEM), 2013
- [30] **S.M.H. Sadati**, M. Borgheinejad, H. Fooladi, M. Naraghi, A. R. Ohadi Hamedani, "Optimum Design, Manufacturing and Experiment of a Passive Walking Biped: Effects of Structural Parameters on Efficiency, Stability and Robustness on Uneven Trains." *Applied Mechanics and Materials*. Vol. 307. Trans Tech Publications, 2013
- [31] R. Sharifi, H. Ghariblou, **S.M.H. Sadati**, "Dynamical Modeling and Optimization of Movement for a Cable Driven Base Robotic Arm Manipulator in an Environment with Obstacles", *The Int. Conf. on Mech. Eng. & Adv. Tech. (ICMEAT 2012)*, Isfahan, Iran (in Persian), 2012
- [32] **S.M.H. Sadati**, M. Naraghi, A. R. Ohadi Hamedani, "Analysis and Optimization of a passive Walking Biped", *19th Annual Conf. on Mech. Eng. in Iran (ISME)*, Birjand, Iran, (in Persian), 2011
- [33] **S.M.H. Sadati**, A. R. Ohadi Hamedani, M. Naraghi, "Design and Build of a Biped Passive Walker: Investigating the Effects of Structural Parameters on Performance, Efficiency and Gait Stability", *19th Annual Conf. on Mech. Eng. in Iran (ISME)*, Birjand, Iran (in Persian), 2011

## Workshop & Symposium Articles

- [34] M. D. I. Reyzabal, **S.M.H. Sadati**, L. D. Cruz, C. Bergeles, "Implementing Dynamic Active Constraints for Safe Remote Robotic Surgery using SOFA", *International SOFA Symposium, 2020*
- [35] ASAME robotic team members and **S.M.H. Sadati**, "ASAME 3: Team Description Paper", *RoboCup World Competition, Singapore, Singapore, 2010*
- [36] ASAME robotic team members and **S.M.H. Sadati**, "ASAME 2: Team Description Paper", *Int. Robotic Festival (Iran Open)*, Tehran, Iran (in Persian), 2010
- [37] ASAME robotic team members and **S.M.H. Sadati**, "ASAME 2: Team Description Paper", *RoboCup World Competition*, Graz, Austria, 2010 - 4th Place in Best Manipulator Design Technical Challenge
- [38] ASAME robotic team members and **S.M.H. Sadati**, "ASAME 1: Team Description Paper", *Int. Robotic Festival (Iran Open)*, Qazvin, Iran (in Persian), 2010 - 4th Place in Real Rescue Robot League