

Sean Thomas



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ABOUT

Technology and engineering have always been my passion. During my PhD, I have learned that the best way to apply my creativity is in research. Being at the forefront of technology and innovation is the ideal way to keep my creative juices flowing.

EDUCATION

EPFL PhD in Robotics, Control and Intelligent Systems (Integrated Actuators Laboratory)

- Smart Gripper : Conception of a Novel type of Gripper powered by Shape Memory Alloys
In the current age of miniaturisation, the advent of artificial muscles has played a crucial role in creating futuristic compact and lightweight devices.
The aim of the project is to explore and create compact integrated lightweight actuators and robotic grippers using artificial muscles such as Shape Memory Alloys (NiTiNOL)
- Supervisor : Prof. Yves Perriard

September 2017 - January 2022

EPFL Master & Bachelor of Science in Robotics and Autonomous Systems

- Polytechnic program with an emphasis on micro-engineering, robotics, autonomous control systems and sensors.

September 2012 - March 2017

EXPERIENCE

Imperial College
London

Master Thesis - Development of Single-Joint Neuromechanics device (Human Robotics Group, Imperial College London)

- Development of a patient-specific exoskeleton system capable of measuring the joint impedance of motor-impaired patients. (<https://www.imperial.ac.uk/human-robotics>)
- Supervisors: Supervisors : Prof. Etienne Burdet; Prof. Hannes Bleuler; Dr. Mohamed Bouri; Dr. Hsien Yung Huang

October 2016 - March 2017

ONWARD/ARC

Human Rehabilitation Robot - R&D engineer internship (Onward)

- The project consisted of the design of the Human Rehabilitation Robot (JANE) and its implementation at the CRR Suva rehabilitation clinic.
- Supervisors: Dr. Joachim v. Zitzewitz; Dr. Urs Keller

July 2016 - October 2016

EPFL Sensor Design of Body Weight Support Robot for Rodent Rehabilitation (G-Lab, EPFL)

- The goal of this project consisted of the design and fabrication of a sensor to track the movement of motor-impaired rodents for a bodyweight support robot for rodent rehabilitation. The project involved sensor design, signal processing and flexure-based structures.
- Supervisors: Prof. Gregoire Courtine; Dr. Joachim v. Zitzewitz

July 2015 - March 2016

PUBLICATIONS

S. Thomas, "Microgripper Device,"
Patent Application

S. Thomas et al., "Designing compliant mechanisms composed of shape memory alloy and actuated by induction heating,"
IOPScience Smart Materials and Structures (SMS), 2021

S. Thomas et al., "A Self-Biasing Shape Memory Alloy Gripper for Lightweight Applications,"
IEEE/RSJ IROS 2021

S. Thomas et al., "Control-Free Mechanical Oscillator Powered by Shape Memory Alloys,"
IEEE/ASME AIM 2021

S. Thomas et al., "Multi-Output Compliant Shape Memory Alloy Bias-Spring Actuators,"
IEEE/ASME AIM 2020

S. Thomas et al., "Shape Memory Effect of Benchmark Compliant Mechanisms Designed With Topology Optimization,"
IEEE/ASME AIM 2020

S. Thomas et al., "Design Analysis of a Shape Memory Alloy Bias-Spring Linear Actuator,"
IEEE LDIA 2019

S. Thomas et al., "Actuation Displacement Analysis of a Self-Switching Shape Memory Alloy Buckled Beam,"
IEEE ICEMS 2018

S. Thomas et al., "Analysis and Reduction of Time Response in Thermally Activated Shape Memory Alloys,"
IEEE ICEMS 2018

S. Thomas et al., "Design and Modelling of a Flexure-based Bistable Gripper Powered by Shape Memory Alloys,"
IEEE/ASME Transactions on Mechatronics, 2022 (pending)

S. Thomas et al., "An Untethered Control-Free Inchworm Robot Powered by a Shape Memory Alloy Mechanical Oscillator,"
IEEE/ASME Transactions on Mechatronics, 2022 (pending)

PERSONAL

Skills Python, C++, Objective C, Javascript, Java, HTML CSS, Matlab, 3D CAD, Finite Element Modelling, 3D Printing, Optimisation, LabView, Sensor Design, Modelling, Actuator Design, Latex

References Prof. Yves Perriard : yves.perriard@epfl.ch
Prof. Gregoire Courtine : gregoire.courtine@epfl.ch
Dr. Joachim v. Zitzewitz : j.zitzewitz@outlook.com