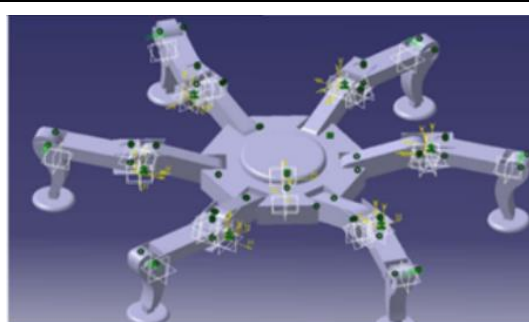


## Facility to develop bulk and thin film shape memory alloy for different functional applications

**Keywords:** SMA bi-morph , Machine tool dampers, dynamic structures, soft robotic, MEMS structures

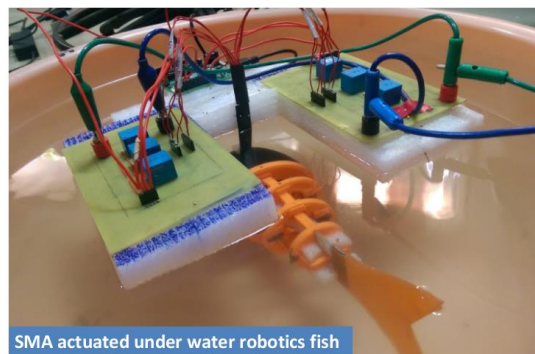
**Write-up:** Mechatronics and Instrumentation lab at IIT Indore has a in-house facility of to synthesize Shape memory alloy bulk structures and thin films at different composition. The facilities has a capability to produce taylor made structures. The laboratory has a capability to develop Both NiTi and copper based shape memory alloy can be developed and test the same using Differential scanning calorimetric analysis. Following are the list of devices developed in house for different applications.

- a) Shape memory alloy based robotics Stewart platform for laser beam machining was developed in-house
- b) Shape memory alloy based micro-mixer coupled with micro valve was developed for automatic mixing in pharmaceutical industries.
- c) Shape memory alloy based under water robotics fish was developed in house to divert in-house.
- d) Shape memory alloy based tree climbing soft- robot was developed in- house
- e) Shape memory alloy based heat engines are under development in collaboration with Volvo Eischer and MHRD
- f) Shape memory alloy based flexible bi-morph has been developed to monitor the life of the transformer
- g) Shape memory alloy based composite structures are under development for flexible aerodynamic structures.
- h) Shape memory alloy based machine tool holders for vibration damping.



SMA actuated Hexapod with suction cup

Figure 1- SMA Actuated Hexa pod for operating at reserved environment



SMA actuated under water robotics fish

Figure 2- SMA Actuated underwater robotic fish