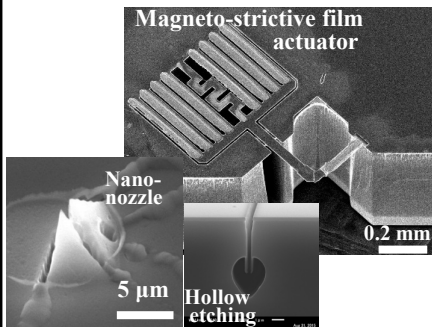


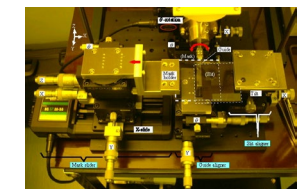
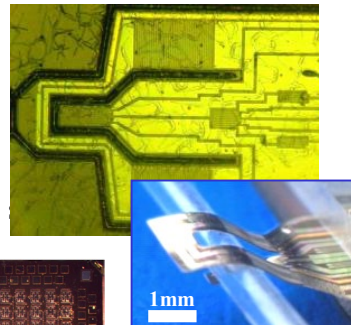
MEMS/Nano device and micro/nano fabrication processes

Professor Takashi Mineta

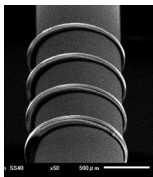
Dual AFM nano-probe for bio-molecular Imaging/operation
(Narrow gapped hollow probes, magneto-strictive switchable cantilevers)



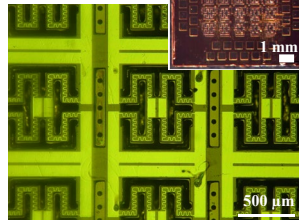
Micro-robot finger
(Shape memory alloy thick film, integrated with strain sensor and micro-heater circuits)



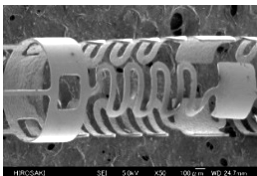
Cylindrical lithography
(home made system)



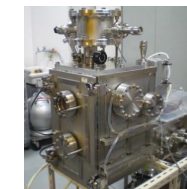
Cylindrically lithographed thick resist pattern



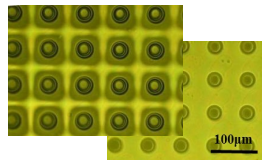
Tactile display device
(SMA type)



SMA micro-catheter
(Tubular bending actuator fabricated by cylindrical lithography and electrolytic etching of an SMA tube)



SMA thick film flash-evaporation
(home made system)



Surface-property-changeable device using soft material PDMS
(active wetting control, tactile feeling changeable skin)

Contents:

We study on MEMS, micro-electro-mechanical-systems, devices such as micro-sensors and actuators. In particular, we study the combination of MEMS/NEMS devices with smart material thin films such as shape memory alloys (SMA), magneto-strictive alloys, and soft materials (PDMS). Based on the technologies, tactile display devices to present feelings, micro-robotic devices for bio-medical manipulations, multi-functional AFM nano devices for bio-molecular operations, remote control mechanism for asteroid probe have been developed in our laboratory. For the micro/nano devices, we have also developed fabrication process technologies in micro/nano scale, for example, thin and thick film deposition of smart materials, micro/nano lithography, and micro-etching techniques.

Appealing point: Planar and 3D structured micro/nano devices can be realized for wide application fields by using our original process technologies and MEMS/NEMS fabrication techniques.

Yamagata University Graduate School of Science and Engineering

Research Interest: MEMS, NEMS,

Micro-sensors, Micro-actuators,

Micro/nano fabrication technologies

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