Information Society Technologies

IST-2001-34718

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IRBI CNRS- U. Tour

Cricket Inspired PerCeption and Autonomous Decision Automata

MESA+

Forschungszentrum Jülich

Coordinator: Jérôme CASAS
Tours, F

The University of Reading

Project funded by the Future and Emergent Technologies arm of the IST Programme - FET Keyaction Life-like perception

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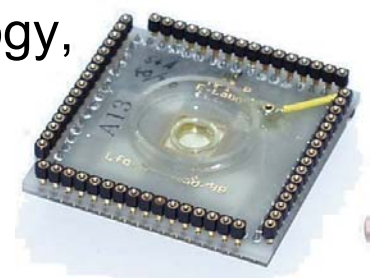
Cricket Inspired PerCeption and Autonomous Decision Automata

- Increase the advancement of **biomimetic** life-like perception systems by providing novel data and concepts on a ‘sensing-perception-action’ chain using highly innovative technologies.

- Combine first rate European expertise in sensory ecology, material sciences, MicroElectroMechanicalSystems (MEMS) and living computers



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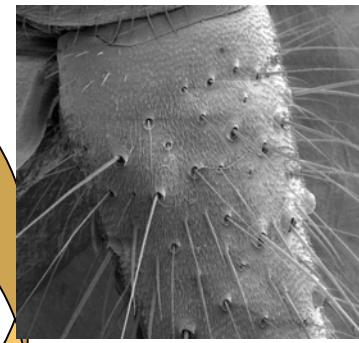
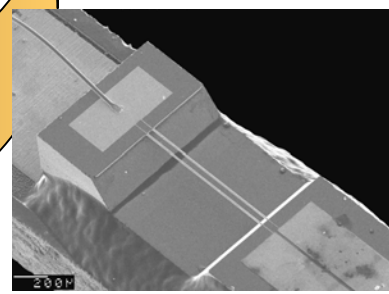
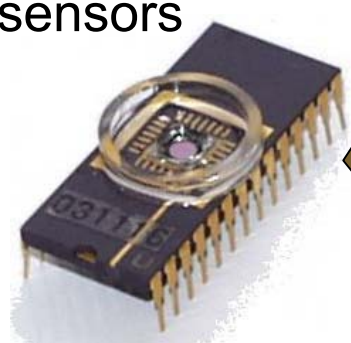
Approach

- Investigate air current perception and escape action of crickets responding to attacking predators
- Characterize and model mechanical and functional properties of mechanoreceptor hairs and hair canopy
- Design large arrays of MEMS sensors
- Build a miniature demonstrator using living computers







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Participants

- ✓ Université Francois-Rabelais Tours - **FRANCE** – *Sensory ecology*
  Leader: J. Casas
  Danger sensing and perception

- ✓ The University of Reading - **UNITED KINGDOM** - *Material science*
  Leader: G. Jerondiminis
  Mechanics of single sensors

- ✓ Universiteit Twente - **NETHERLANDS** – *Nanosensors*
  Leader: G. Krijnen
  MEMS flow sensors

- ✓ Forschungszentrum Juelich - **GERMANY** – *Hybrid systems*
  Leader: A. Offenhaüser
  Bioelectronic devices, Hybrid demonstrator

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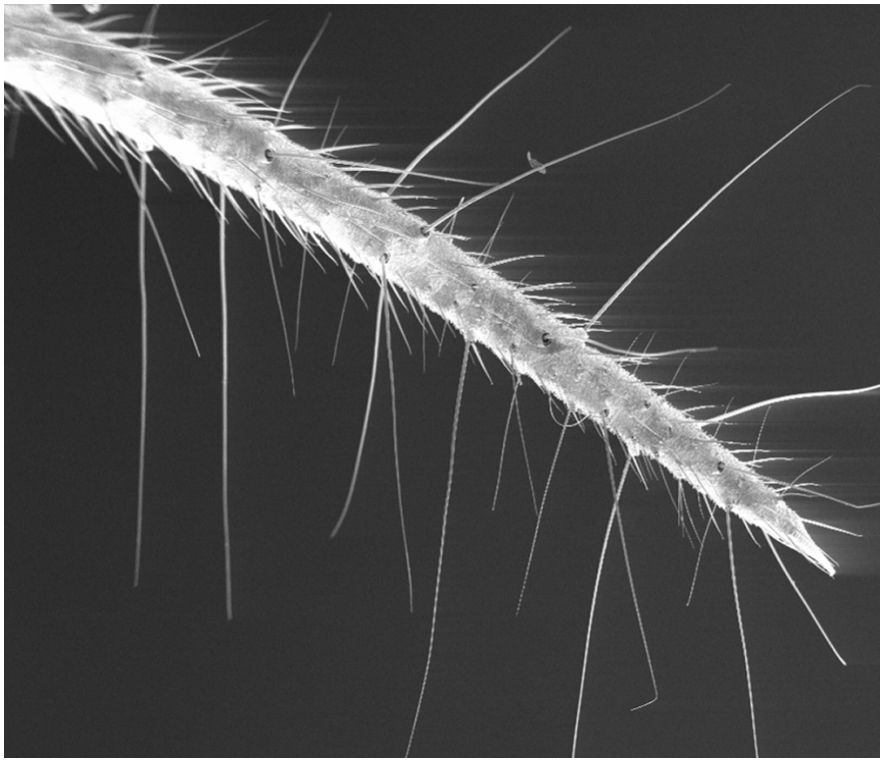
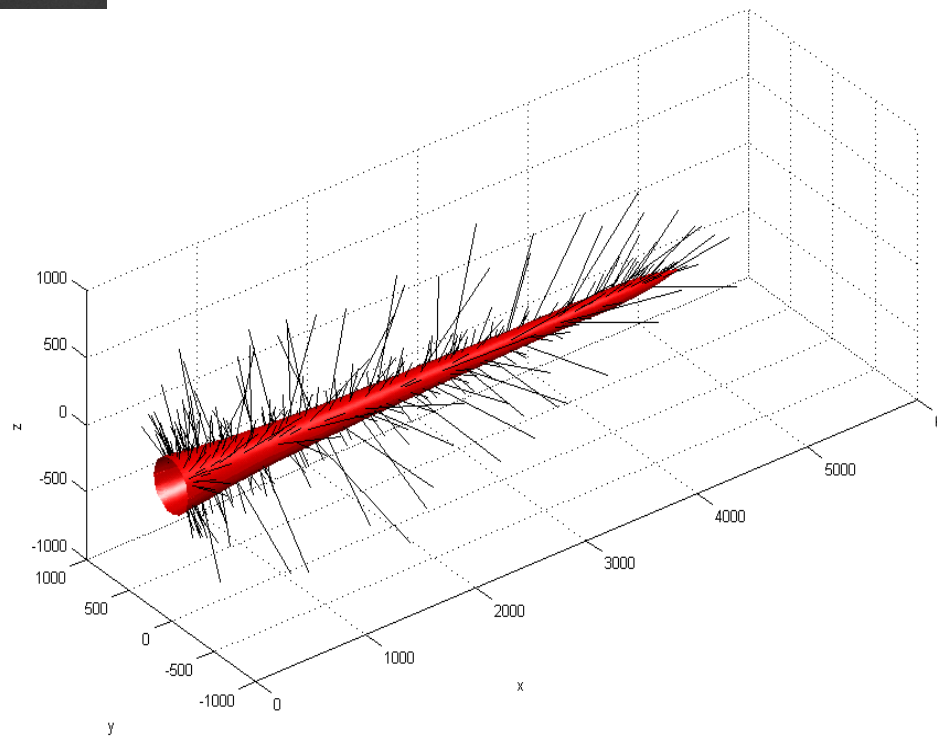
Mapping sensing organ





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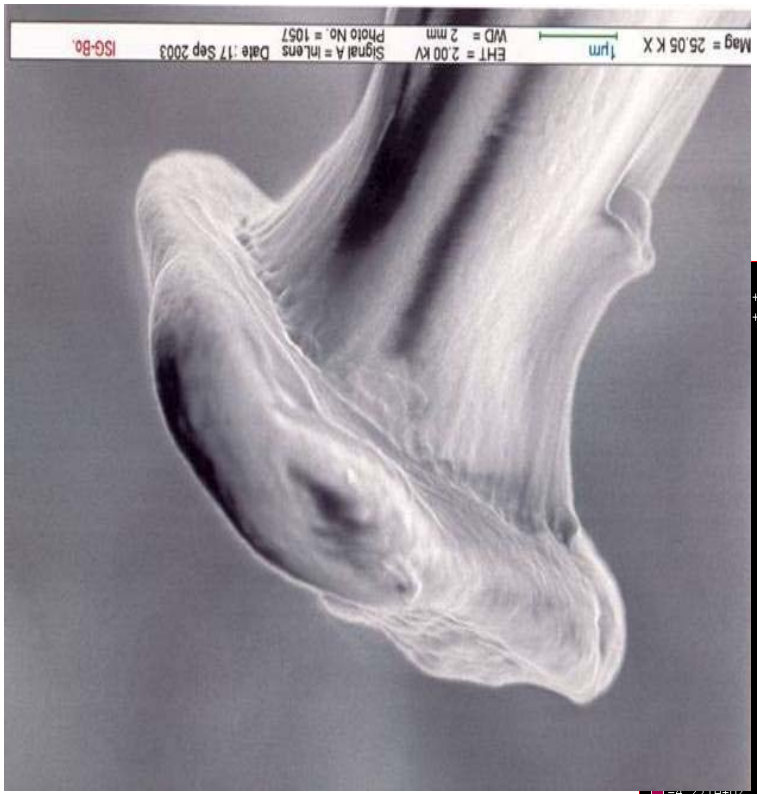
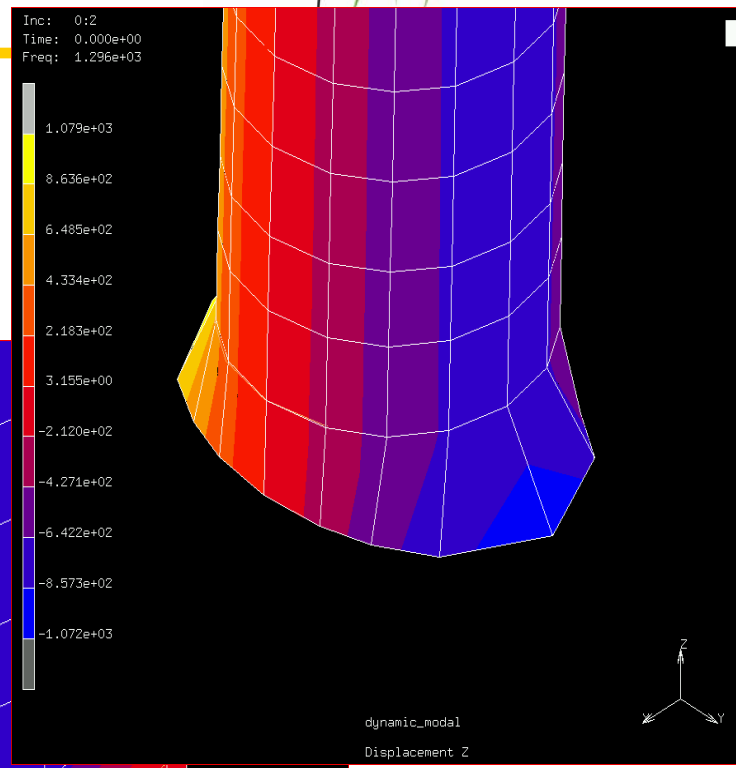
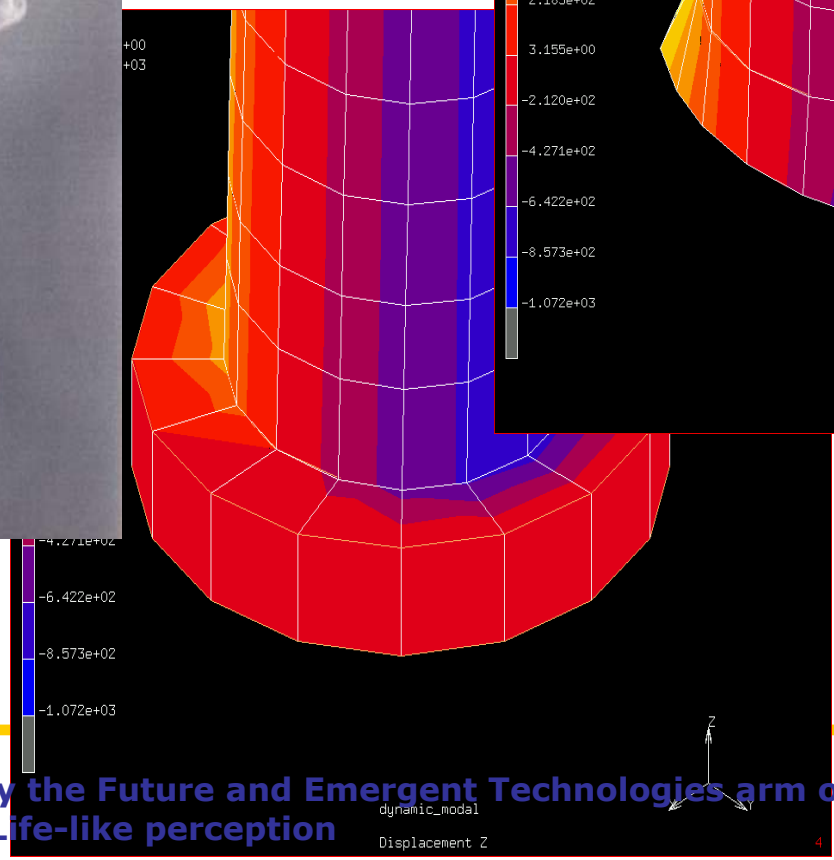
FE modelling of hair socket







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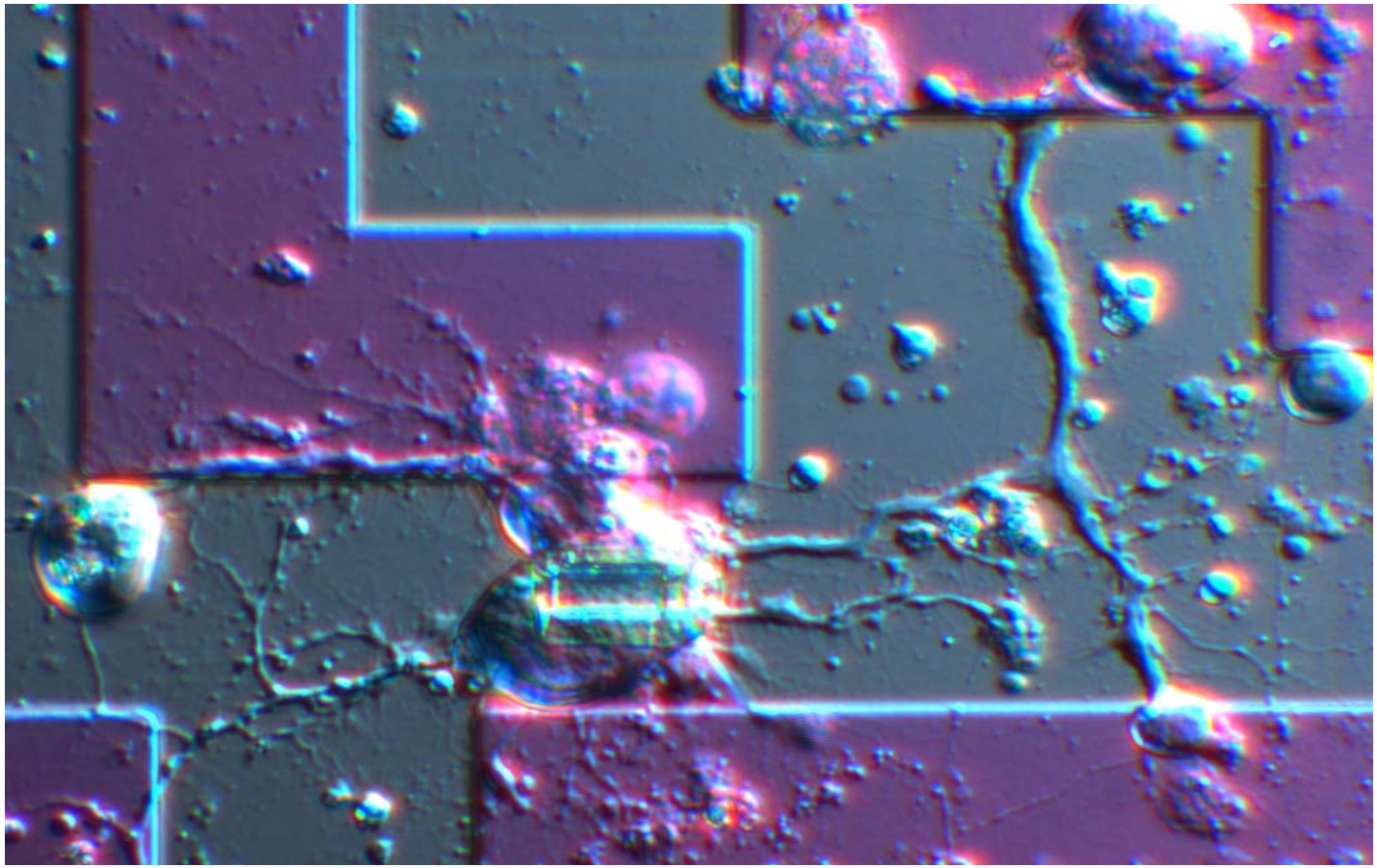
Insect neurons talking to transistors



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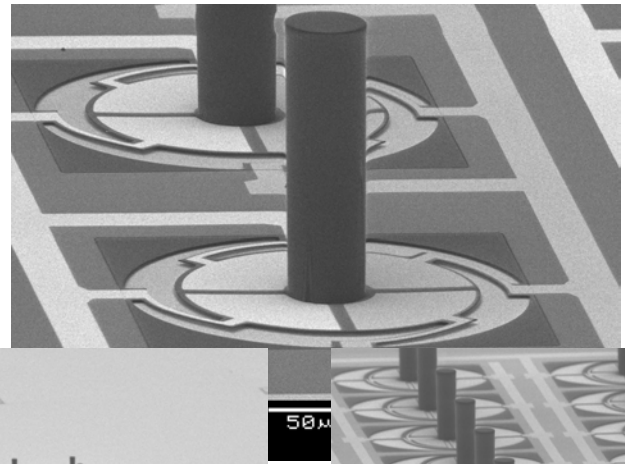
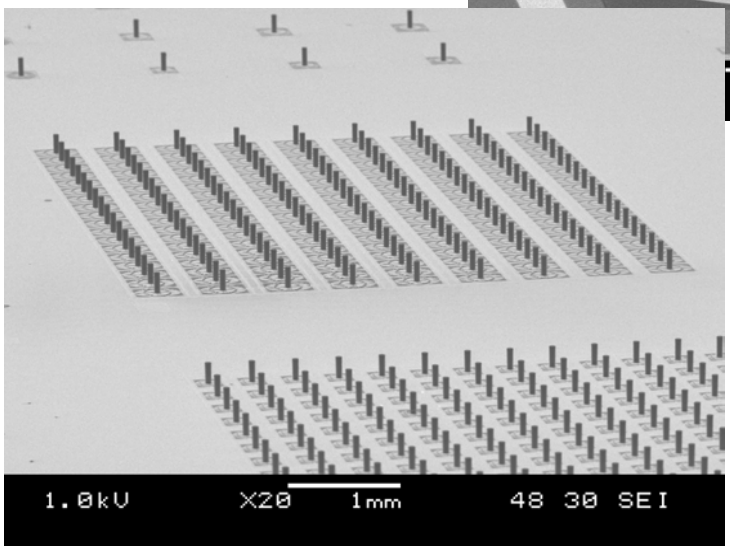
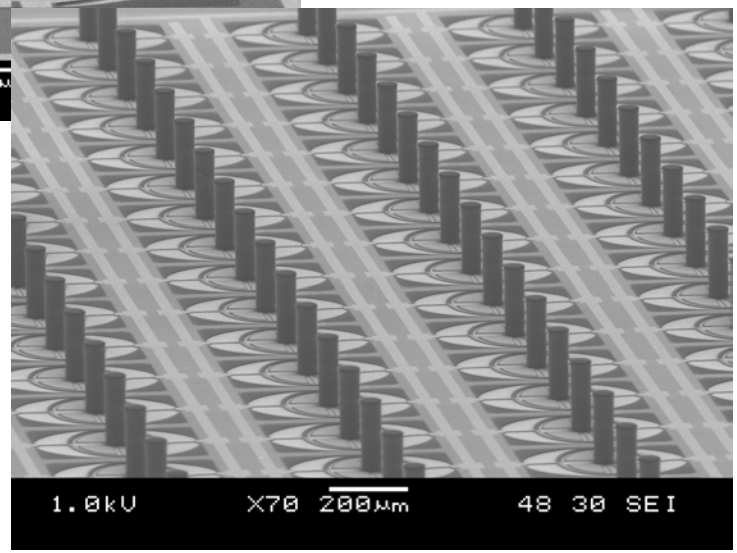
The bionic hair







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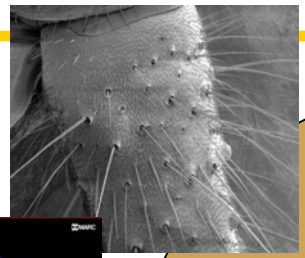
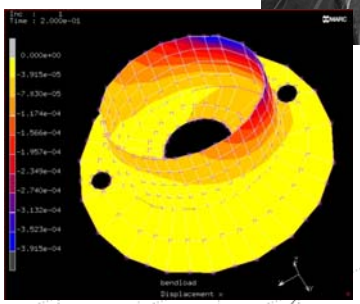
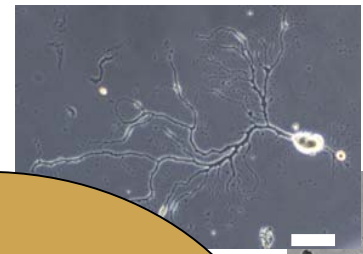


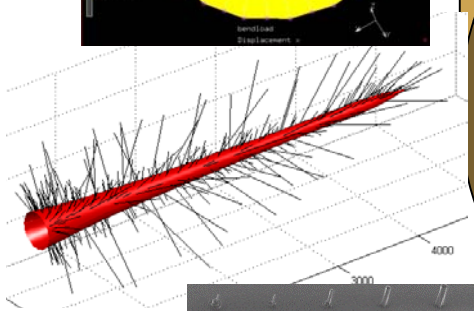


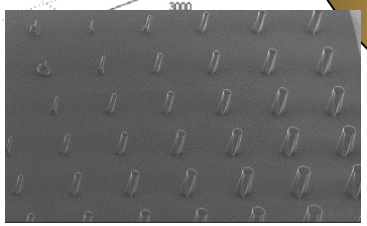


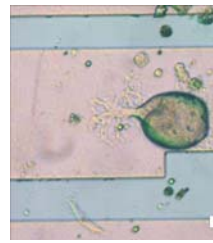
Sensing

Perception

Action







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