

ERF 2017

WORKSHOP ON MINIATURISED ROBOTICS



Towards a European open platform on
miniaturised robotics

The company

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PERCIPIO ROBOTICS designs, builds and sells
smart robotic systems for:

- Cobotic micro-assembly
- Help in extreme micromanipulation
- Automated micromanipulation
- Automated micro-assembly



Femto-ST Institute's spinoff founded in 2011:

- 15 years of know-how on world class research
- Support from french innovation agencies
- Valuable IP on technologies and software



Team of 15 engineers and PhD,
5 technicians in
mechanics,
microtechnics,
cleanroom fabrication,
software design and
robotics.

Domain of expertise

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Designing / prototyping:

- Microgrippers for micromanipulation (with embedded sensors)
- Holders for microcomponents
- High precision robotic architecture (based on commercial components)
- Automation and robotic scripts



R&D challenge

What kind of tool / system is not already available to do this micro-assembly task?

Integration / production:

- Microgrippers and end-effectors (silicon, polymer, metal...)
- High precision robotic systems
- Software for micro-assembly automation
- High-end machines for industrial production



Industrial challenge

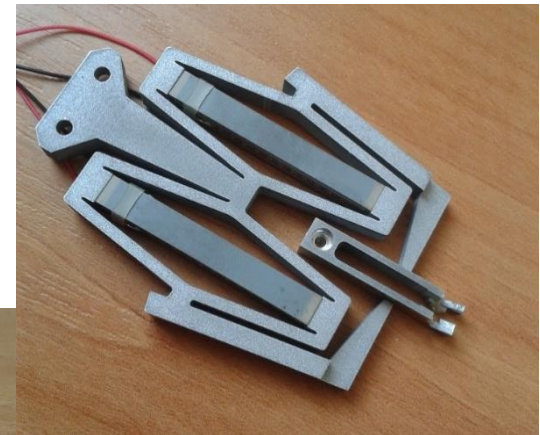
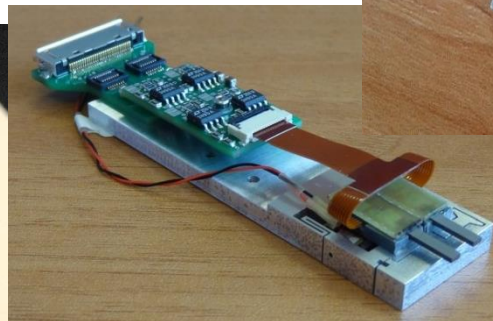
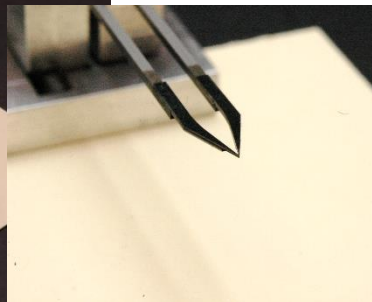
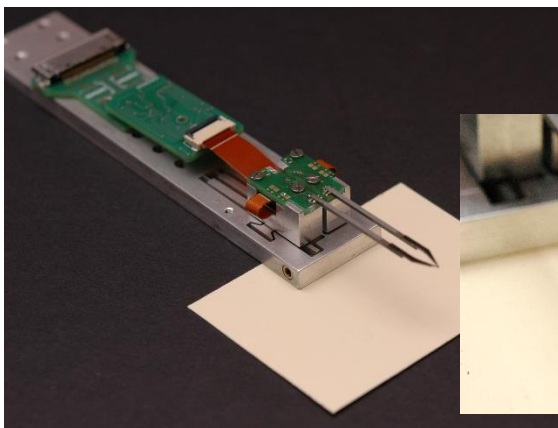
Ok, now we'll build the machine to do this micro-assembly process.

Available technology

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Grippers and tweezers:

- 4 dof piezoelectric tweezers (high flexibility):
500 μm stroke, tunable gap 2 mm, 40 mN grasping force
- 4 dof piezoelectric tweezers (high force):
1,6 N grasping force, 20 μm stroke, tunable gap 2 mm
- 1 dof piezoelectric amplified tweezers:
2,5 N grasping force, 300 μm stroke

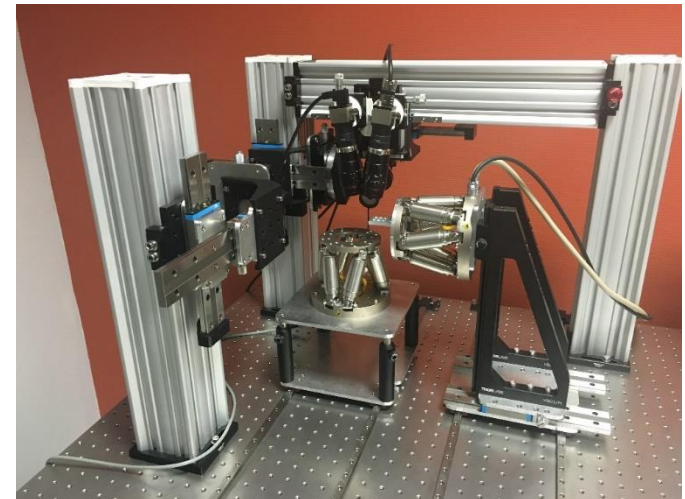


Available technology

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Robotic platforms:

- Chronogrip (compact / transportable):
6 dof robot, 2 cameras, 1 gripper, 2 interfaces for add. modules
- High speed robot (accuracy and speed):
4 dof robot, 1 camera, 1 gripper
- DemoMeQa (high end modular test platform):
12 dof robot (2 hexapods), 3 cameras, up to 6 interfaces for add. modules



Available technology

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Software:

- Robot system driving software AP2M:

Modular software architecture (LabView-like) for fast creation of driving software of complete robotic systems (multi-manufacturer components).

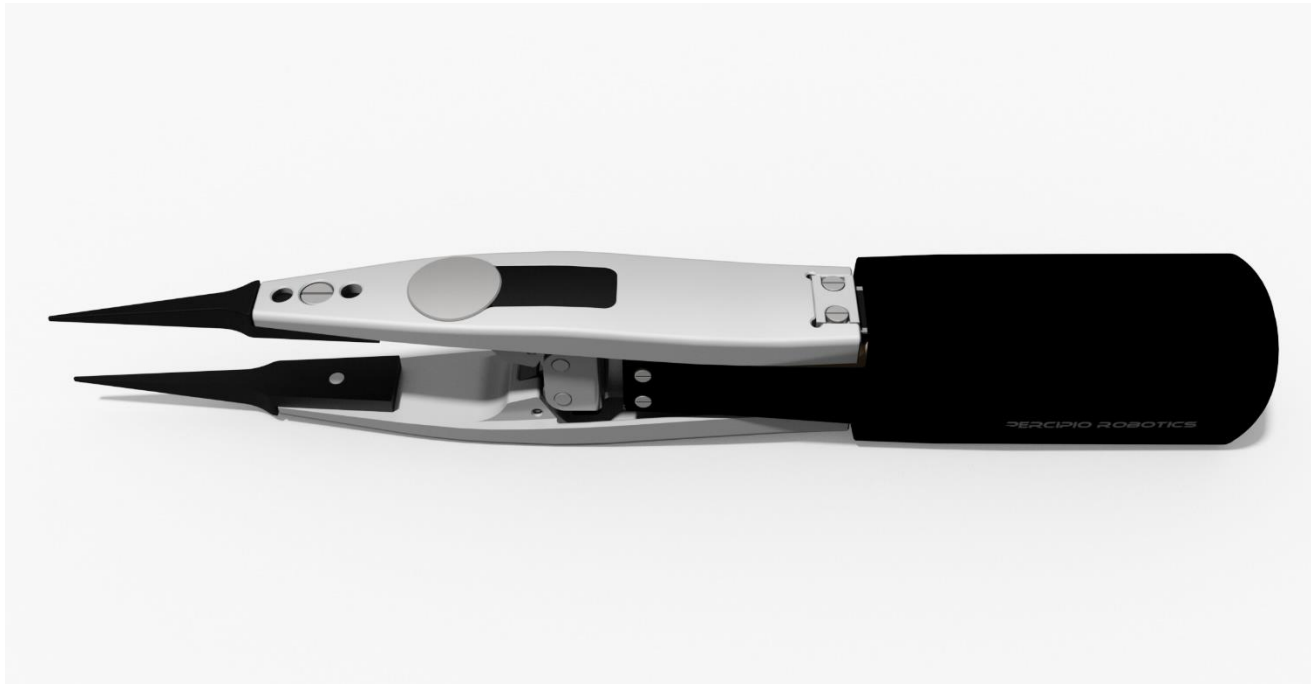
Scripting of repeatable/smart robot task linked to vision and force sensors.

- Vision software dedicated to microvision F@stCV

Camera for computer vision as a black box. Robot sends vision algorithm parameters in real time to get the information it needs.

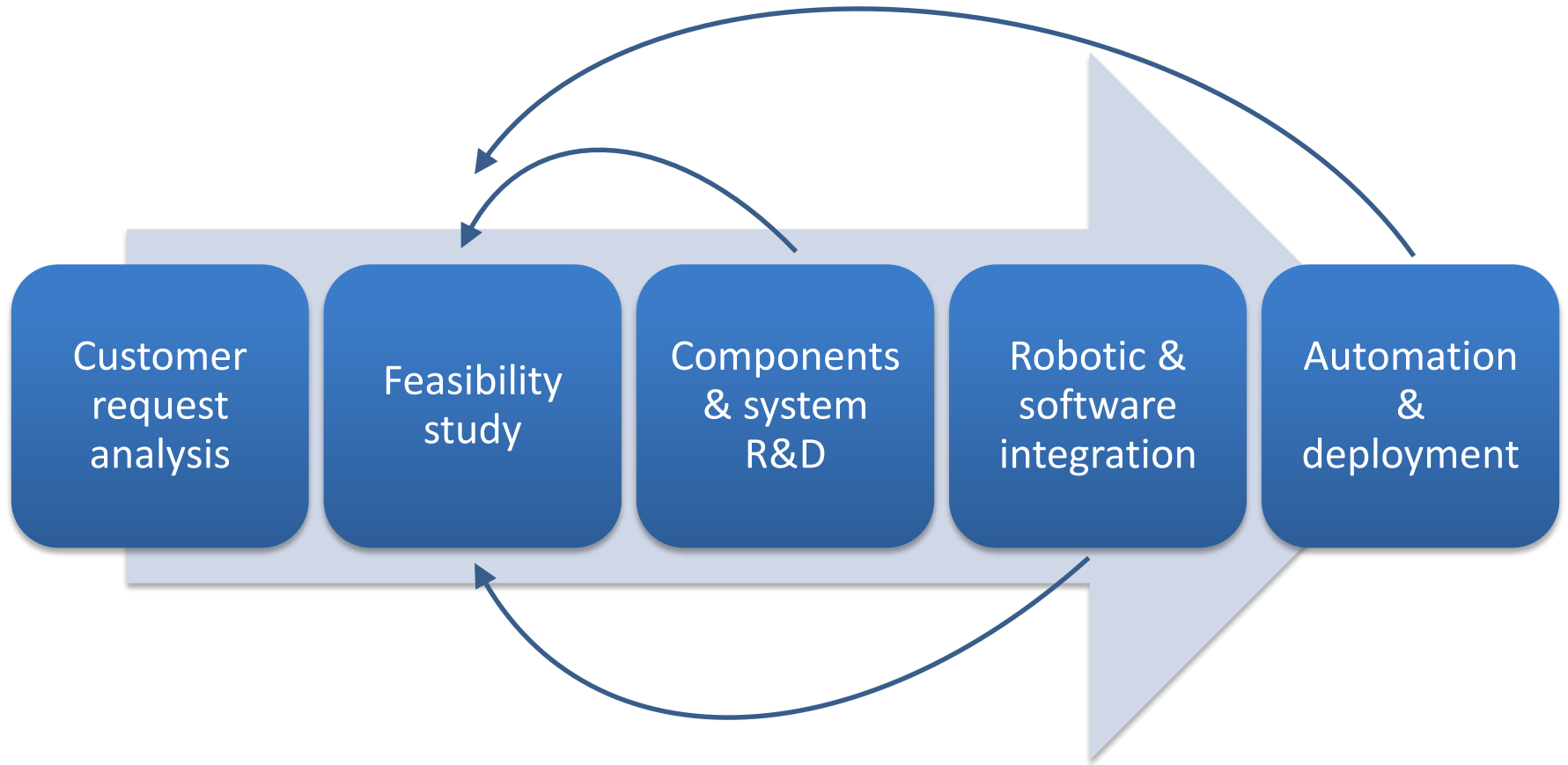
Human Machine Interfaces:

- PC Tablet (tactile interface on camera image)
- Falcon force feedback haptics (3 dof)
- Touch 3D Stylus (3 dof force feedback, 6 dof sensor)
- Home made haptics (Teletweezers)



Feasibility platforms

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Access proposal

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- **Free access for research partners**, fees on training (actual costs)
- **Percipio Robotics engineering support** on module/software development and integration must be **shared with academic partners** (IP shared as well, and exploitation exclusivity options with royalties paid to the research partner)

To be discussed, depending on Percipio Robotics interests

- New Percipio Robotics **internal developments are automatically available** on the platform
- **Paid access for industrial partners** including:
 - fees on training
 - engineering support

NDA agreement, exclusivity of the results for the industrial partner

THANK YOU FOR YOUR ATTENTION



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