No-Touch Robotics
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What We Do

Conventional robotic grippers are limited in their ability to handle small and fragile components. This makes it difficult to automate processes involving such objects. By using acoustic levitational forces, No-Touch Robotics develops damage and contamination free contactless robotic grippers for handling fragile objects.

Value Proposition
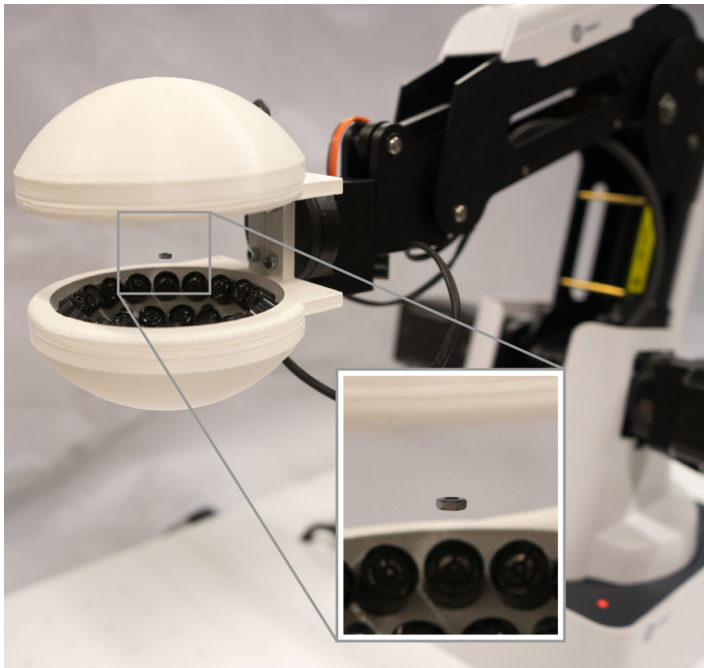
GRIP OBJECTS WITHOUT TOUCHING THEM
Automate processes that had to be performed manually before.

SAVE TIME AND MONEY
The same gripper can be used for a variety of object shapes.

INCREASE QUALITY AND YIELD
Damage and contamination-free handling of precious components.

IMPROVE ENVIRONMENTAL FOOTPRINT
Reduced production rejects.

Application Areas

	WATCHMAKING & MICROMECHANICS	SEMICONDUCTOR INDUSTRY	PHARMA/ BIOTECH
Automate manual processes	✓		
Contamination and damage free	✓	✓	✓
Handle a wide variety of shapes	✓		
Handling/dispensing of fluids		✓	✓
Improved quality and yield	✓	✓	
No particle generation		✓	
Isolation of hazardous substances		✓	✓

Advantages / USPs

Easy Integration	• Retrofitting of existing robotic/handling infrastructure possible • Substitution of existing grippers • Design-in support/consulting provided
Precise Manipulation	• Micrometer-range contactless manipulation of levitated object • Drastically reduced precision requirements and cost for robotic arm
Integrated Quality Control	• Real time 3D scanning and quality control of gripped object possible • Visualization-based manual control of gripped object
Versatile & Robust	• Various actuator shapes/sizes available • Closed-loop position control of levitated object • Integrated power electronics

Technology
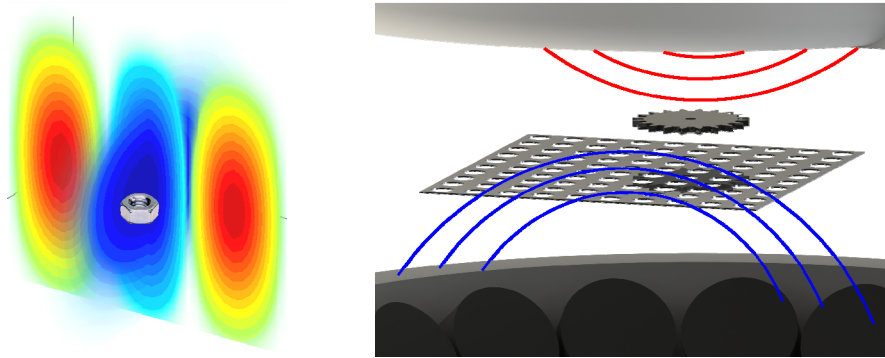
The gripped object is levitated in the low pressure regions of a non-audible acoustic field, as shown in the figure on the left. By using arrays of small sound transducers, the distribution of this field, and thereby the position and forces acting on the object, can be manipulated with high precision.

The gripper system consists of electromechanical transducers with corresponding power electronics for their excitation, control circuits, as well as a proprietary control software. Optionally, a visual feedback system, including object recognition capabilities, can be used to monitor the gripped object.

The handled object, e.g., a small gearwheel, is picked/placed by the gripper from/onto an acoustically transparent surface (metal grid) as shown in the figure on the right. Sound waves from the lower (blue) and upper (red) half of the gripper overlay each other. Alternatively, objects can be picked/placed from/onto solid surfaces that are acoustically reflective. In this case, only the upper half of the gripper is used while picking and placing.

Specifications

Gripped Objects	Dimensions ≤ 10 mm, density up to 8 g/cm³, depending on geometry
Hardware	Self-contained, low-effort integration
Interfaces	RS-232, RS-485, CAN, I2C, LAN, other interfaces upon request
Software	Proprietary, all common operating systems