

Adaptive mechatronics for **Sustainable Logistics**,
on **Earth** and in **Space**

Problem

63%

log-companies: need more automation

10%

Damage: packaging

94%

sat-GEO: ½ lifetime with > 1 failure

+18%

operational cost: due to space debris

https://www.ey.com/en_it/supply-chain/how-covid-19-impacted-supply-chains-and-what-comes-next

<https://www.packagingdigest.com/trends-issues/mitigating-packaging-damage-supply-chain-0>

<https://www.unoosa.org/pdf/pres/stsc2011/tech-43.pdf>

https://indico.esa.int/event/321/contributions/6418/attachments/4364/6586/CleanSpaceIndustryDays_OHB_21092021.pdf

Solution

TRL 5

Patent request ongoing

Conformable and versatile thin-layer for a sensorized grasping action

Adhesive when electrically activated!



- ✓ **Versatile**
- ✓ **Scalable** ($\sim 0,5 \text{ Kg/cm}^2$)
- ✓ **Lightweight** ($\sim 1 \text{ g/cm}^2$)
- ✓ **Efficient** ($< 1 \text{ W}$)
- ✓ **Fast** ($< 10 \text{ ms}$)



Pneumatics



Magnets

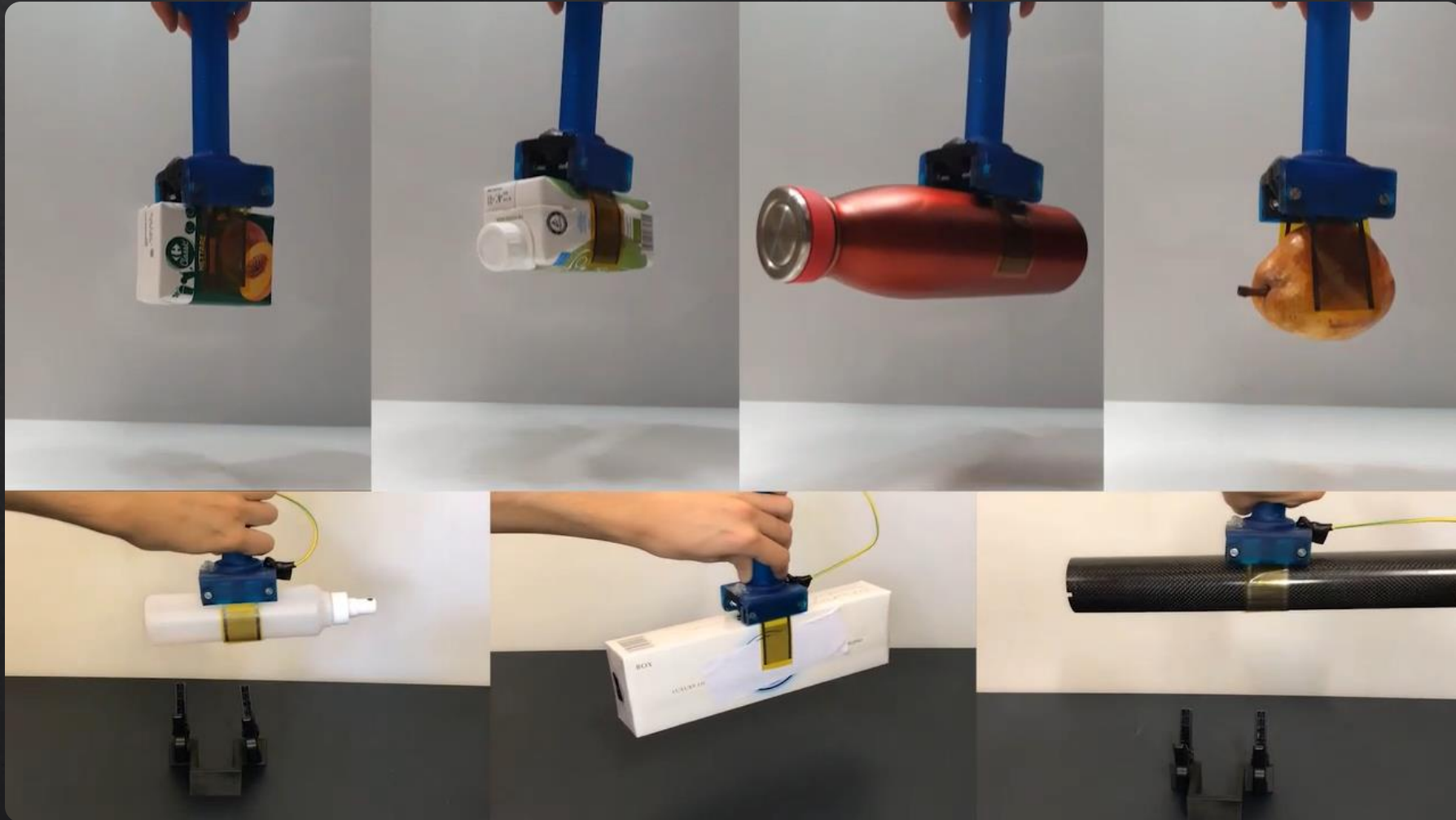


Heat dissipation



Target predisposition

Any material and surface

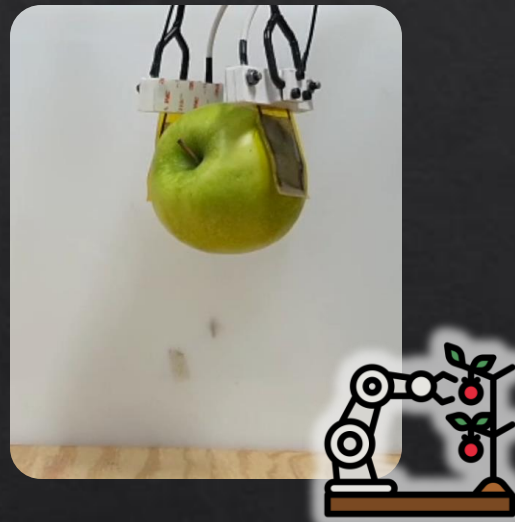


Applications



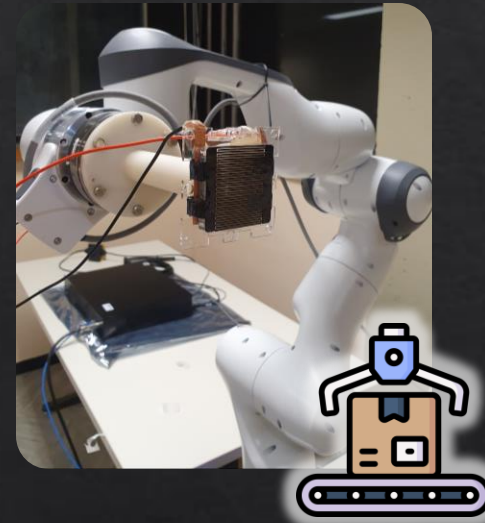
Last-mile delivery

Very suitable for autonomous robots employing batteries



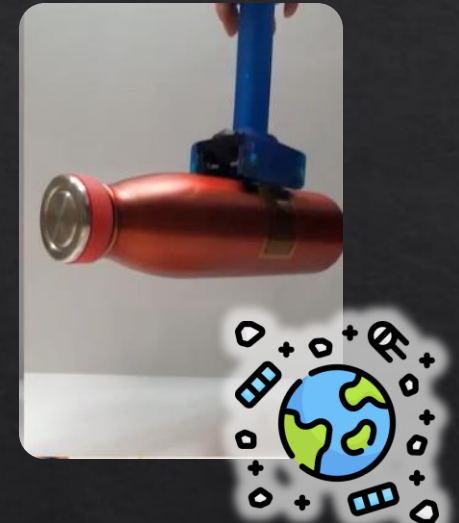
AgriTech

Fruit and vegetable picking in vertical farming



Industrial

Production line handling, pick&place, e assembly

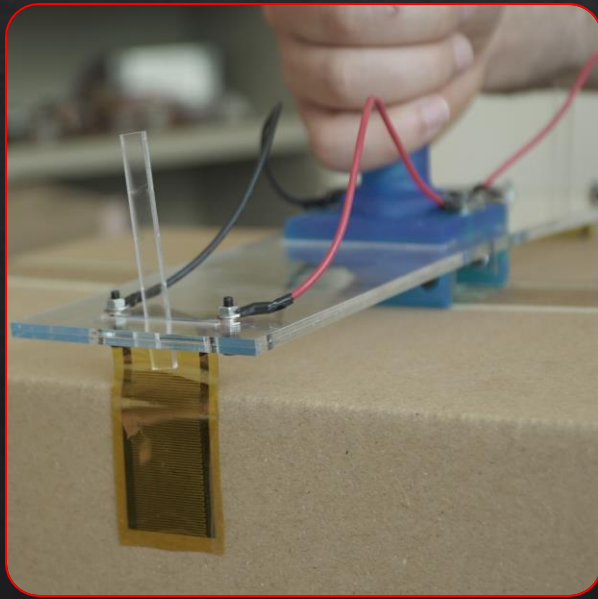


In-Orbit Servicing

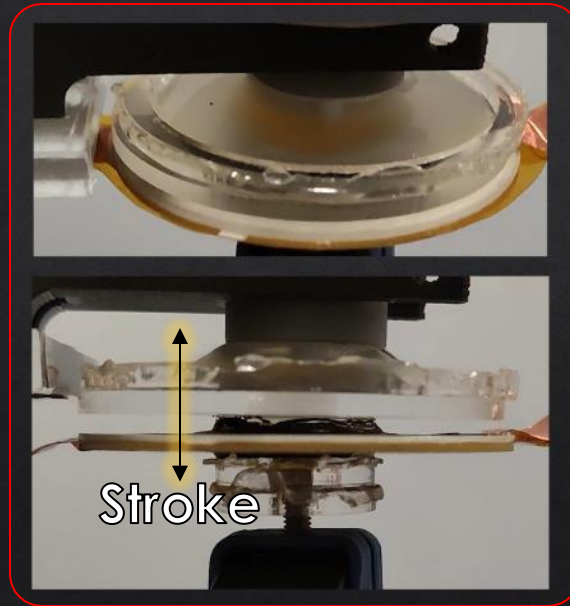
soft docking and space debris removal

Technological innovation

Electro-active, flexible and conformable thin-film, applicable as a coating and with multiple functions



Electro-adhesion



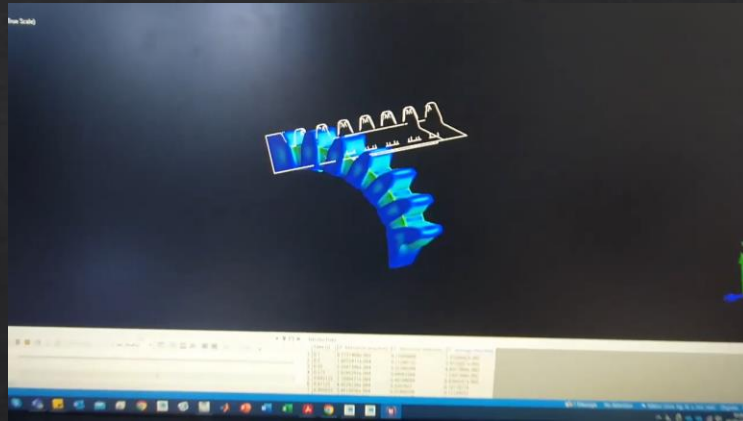
Actuation



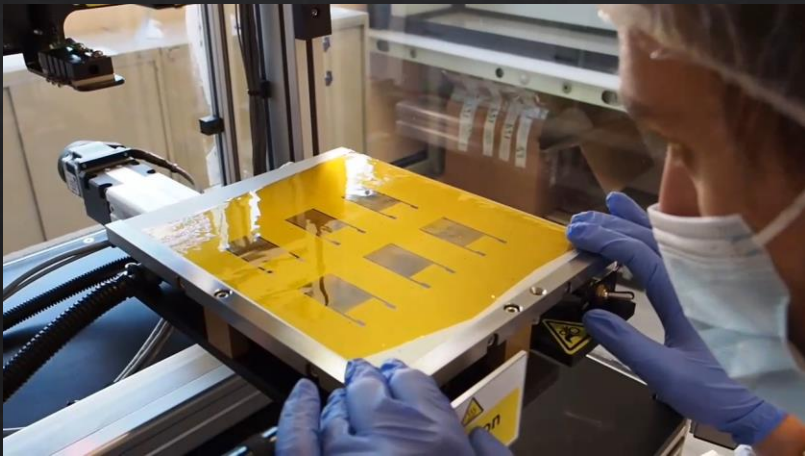
Capacitive Sensing

How is it produced?

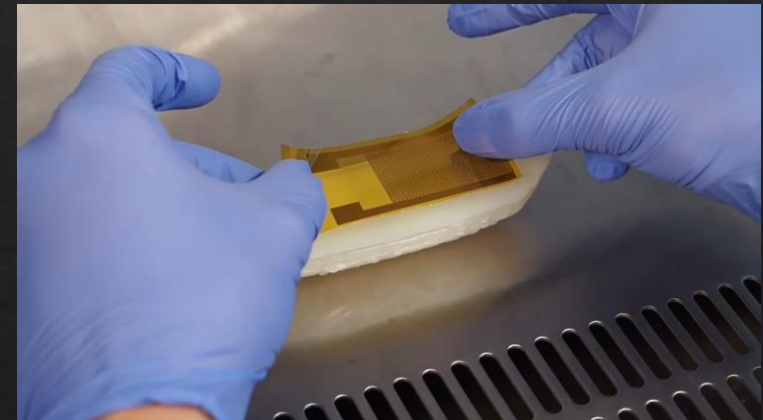
Mechanical Design



Printed Electronics

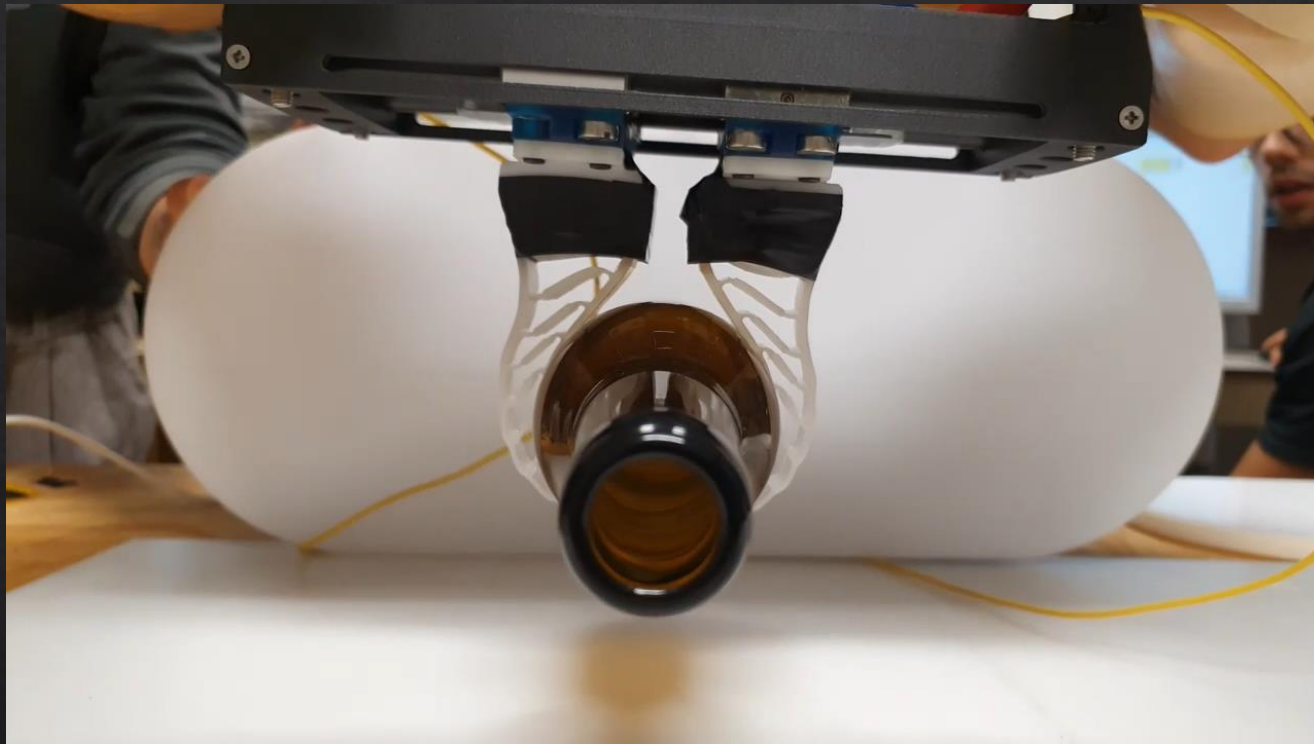


Assembly



Grasping Mechanism

Adaptive electro-active devices



Team

Founder



Lorenzo Agostini, CEO
Ph.D. scuola Sant'Anna di Pisa
M.Sc. Mechanical Eng., PoliMi
Past: R&D in BOSCH

Founder



Camilla Conti, COO
Ph.D. Politenico Milano
M.Sc. Energy Eng., PoliMi
Past: R&D in GE

Founder



Ing. Gavino Boringhieri
Industrial Expert
Business Angel

Founder



Prof. Rocco Vertechy
Full Professor Università di Bologna
Director at SAIMA laboratory



Printing electronics



Chiara Scagliarini
Now: Ph.D. @ AdapTronics
M.Sc. Matter Physics, UniMore



Federico Bertolucci
Now: Ph.D. SAIMA lab
M.Sc. Matter Physics, UniBo

Mechanical design



Marco Caselli
Now: Ph.D. SAIMA lab
M.Sc. Mechanical Eng., UniBo



Amedeo Carloni
Now: Ph.D. SAIMA lab
M.Sc. Mechanical Eng., UniBo



Eugenio Monari
Now: Ph.D. SAIMA lab
M.Sc. Automation Eng., UniBo

Automation

Communication



Chiara Biscontin
Now: Product & Digital Designer
Meng: Product Design Engineering

Future teammates: (after MVP)



Giacomo Bonomi, CSO
Now: Sales & Business dev., Siemens
M.Sc. Mechanical Eng., PoliMi



Looking for experts
Space Tech
IoT and capacitive sensing



Technical Team
(growing):

Printing electronics



Chiara Scagliarini
Now: Ph.D. @ AdapTronics
M.Sc. Matter Physics, UniMore

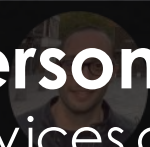
Mechanical design



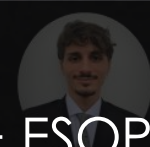
Federico Bertolucci
Now: Ph.D. SAIMALab
M.Sc. Matter Physics, UniBo

Personnel

occasional services contracts + ESOP



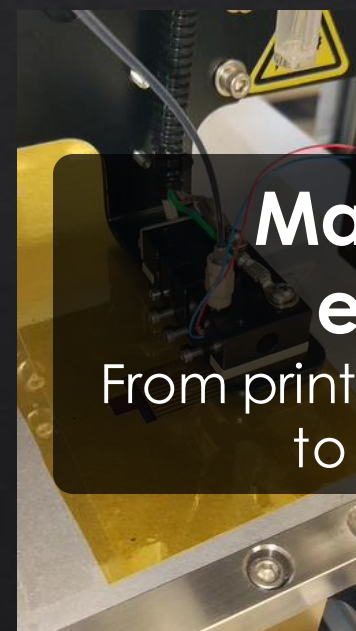
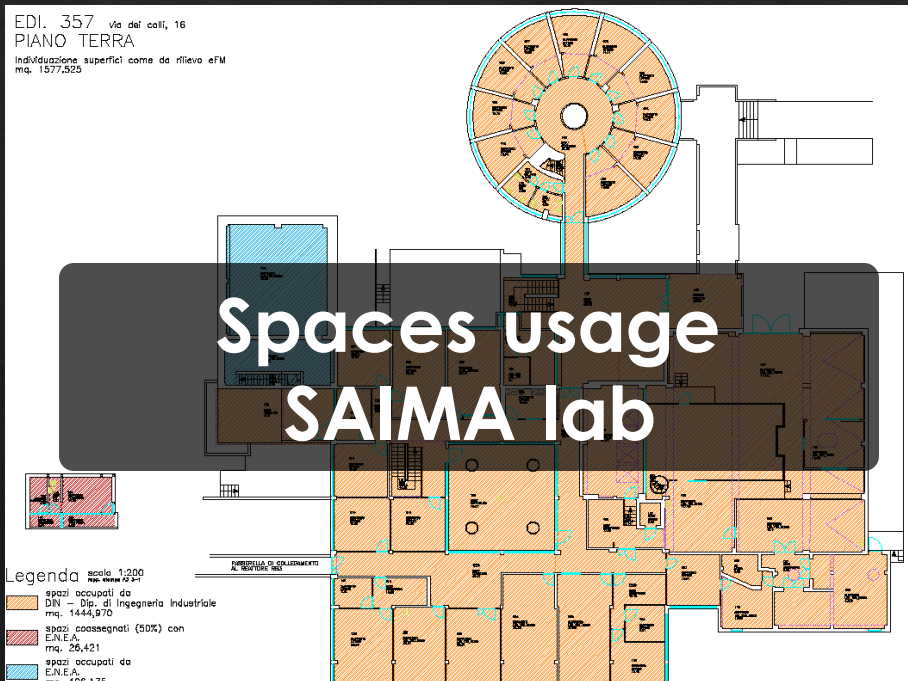
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M.Sc. Mechanical Eng., UniBo



Eugenio Monari
Now: Ph.D. SAIMALab
M.Sc. Automation Eng., UniBo



Machines and equipment
From printed electronics, 3D, up to machine shop

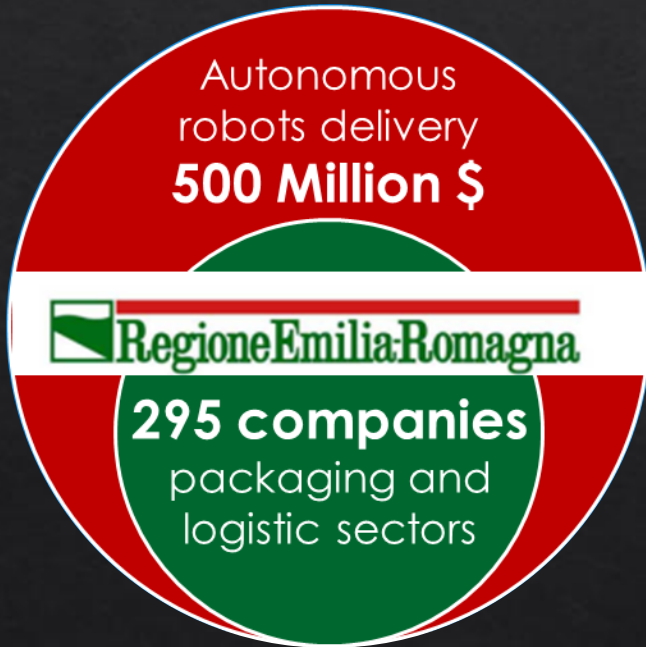
- **Intellectual Property** 

- **Express License** 

- **Business plan** 

Market

Earth

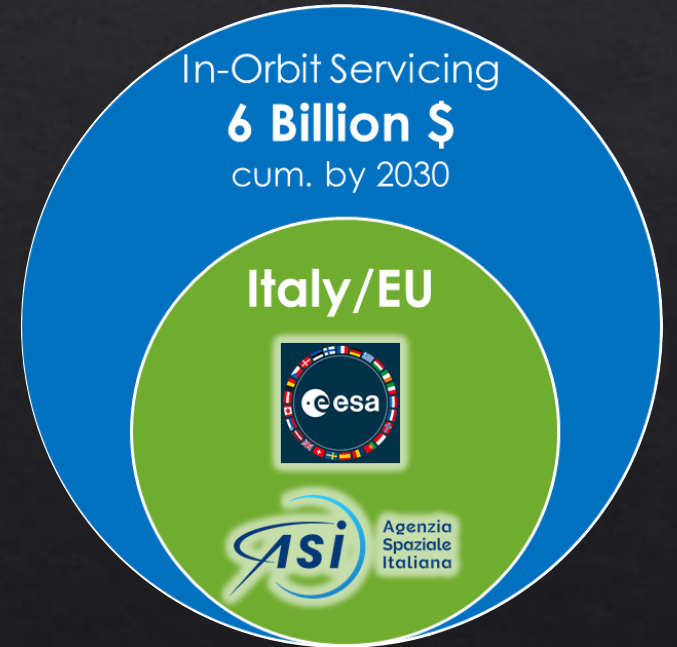


Logistic sector
10 Trillion \$

Material handling equipment
210 Billion \$



Space



<https://www.metsaboard.com/investors/Global-packaging-market/>

<https://www.pnewswire.com/news-releases/>

<https://www.globenewswire.com/en/news-release/2021/05/17/2230618/0/en/>

<https://www.alliedmarketresearch.com/logistics-market>

<https://www.fortunebusinessinsights.com/industry-reports/material-handling-equipment-market-101501>

http://www.investinemiliaromagna.eu/it/news/2021/04/Advanced_Mechanical_Engineering_in_Emlia-Romagna.pdf




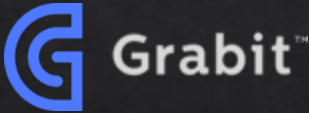


<https://www.nsr.com/in-orbit-servicing-stepping-up-to-the-challenge/>

<https://www.spacefoundation.org/2021/07/15/global-space-economy-rose-to-447b-in-2020-continuing-five-year-growth>

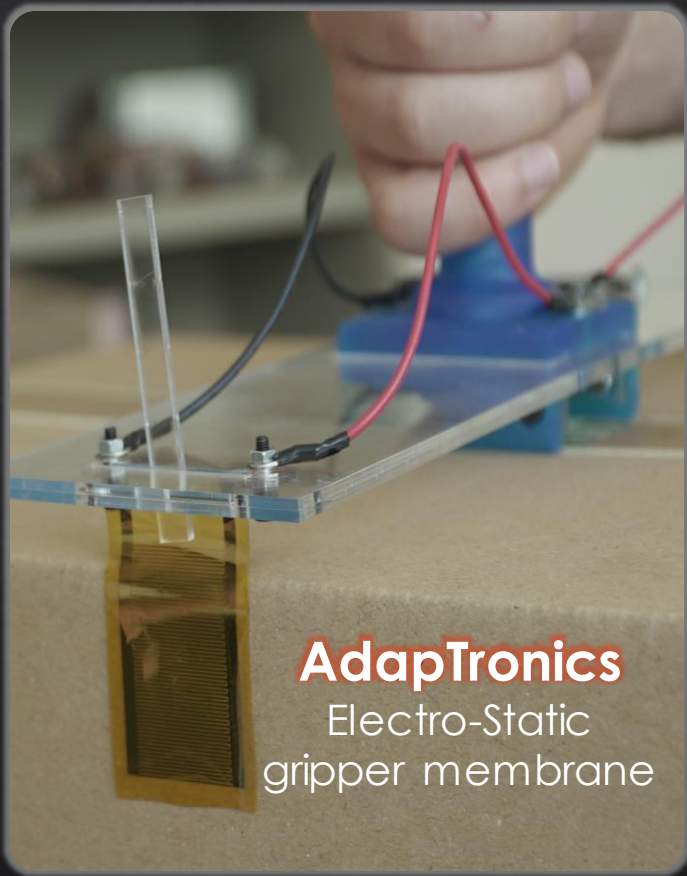
<https://www.fortunebusinessinsights.com/space-debris-monitoring-and-removal-market-104070#>

<https://www.researchandmarkets.com/reports/5185334/active-space-debris-removal-market-a-global>

Competitive Landscape

| | COMPACTNESS | VERSATILITY | EFFICIENCY | PRE DISPOSITION | DISTRIBUTED SENSORS |
|---|-------------|-------------|------------|-----------------|---------------------|
|  | Green | Green | Green | Green | Green |
|  | Red | Red | Red | Green | Red |
|  | Red | Red | Yellow | Red | Red |
|  | Yellow | Green | Green | Green | Red |
|  | Yellow | Green | Red | Red | Red |
|  | Yellow | Yellow | Red | Green | Red |

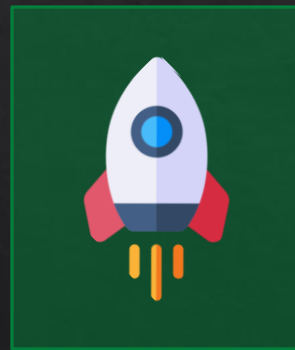
Business model



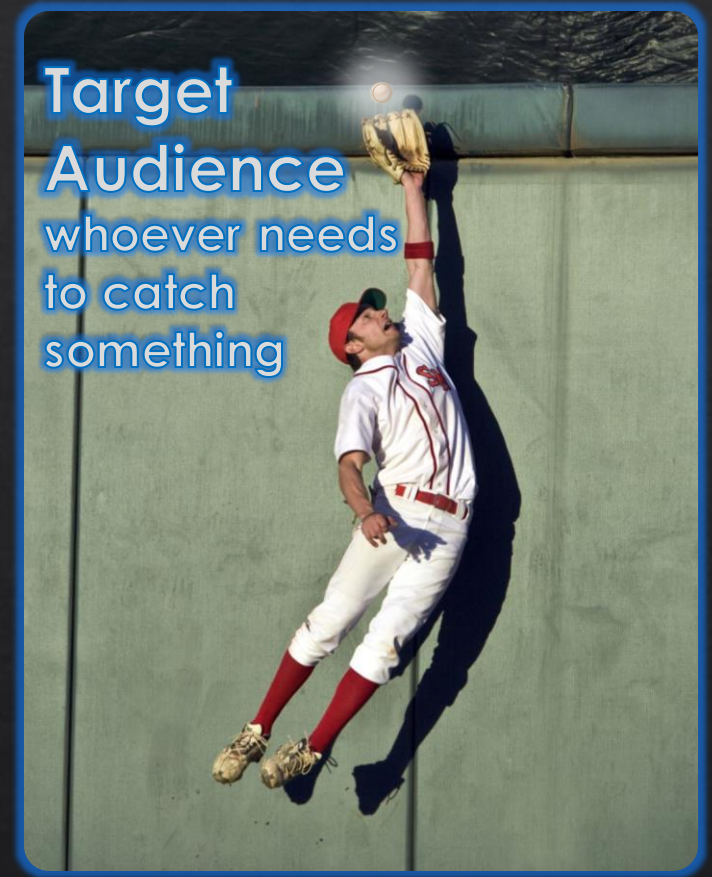
- 1) Direct sales
- 2) System integrators



€/unit



€/m²



Traction

Raised 150k€ equity-free

Awards and grants



startcup
LOMBARDIA



JUMPSTARTER

StartUp programs and incubation



Mind the Bridge



InnoVentureLab



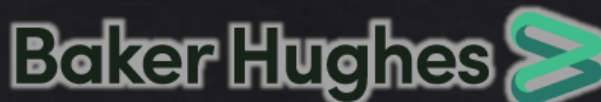
Pilot Projects On-going



Interest for PoC



Starting soon



Perseverance



Roadmap

Product-Market fit

2022



Startup
Foundation

2023



PoC
Ongoing



MVP
Spin-in tech

2024



Early Adopters
Direct sales



Industrial plant
Production

2025



Clients
Scale up sales

Our prototyping Lab on "*Colli Bolognesi*", Italy



Technology for **Life on Planet Earth...**

... and Beyond!