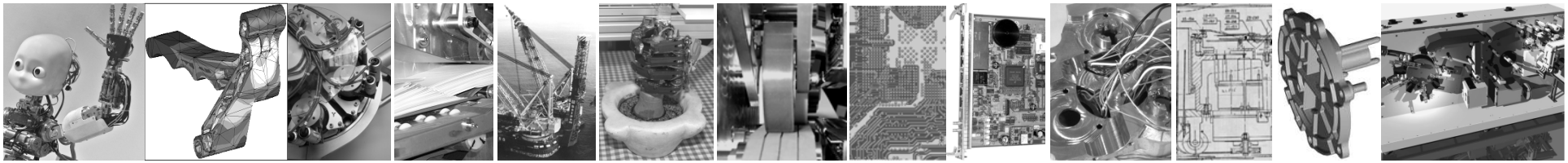
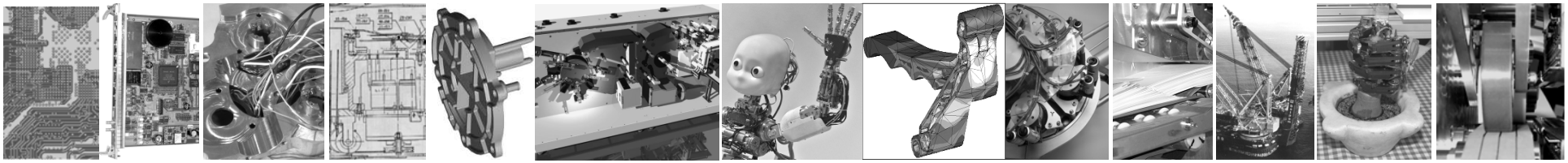
telerobot



ECHORD: possible scenarios and experiments



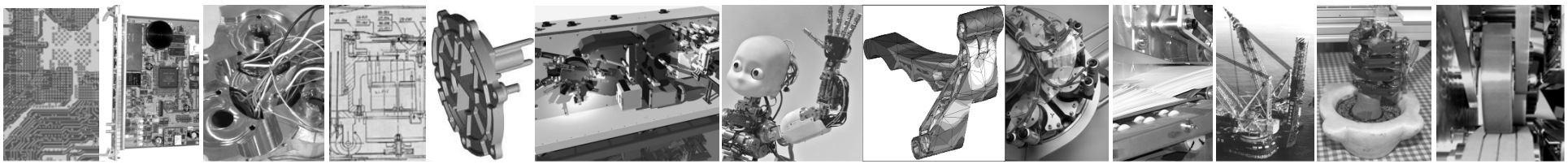
ISO 9001
BUREAU VERITAS
Certification

Munchen, September 4 , 2009

WHO WE ARE: Technology Integrators

Telerobot OCEM is a society that develops novel high-tech products and produces prototypes and small series of them;

Since early '90 Telerobot designs complex systems, in particular in the field of Robotics, Automation, TLCs, Biomedical Sciences. From a more general point of view, Telerobot is a main actor in all the fields that require deep expertise in integrating mechanics, electronics and computer sciences.



WHERE WE ARE

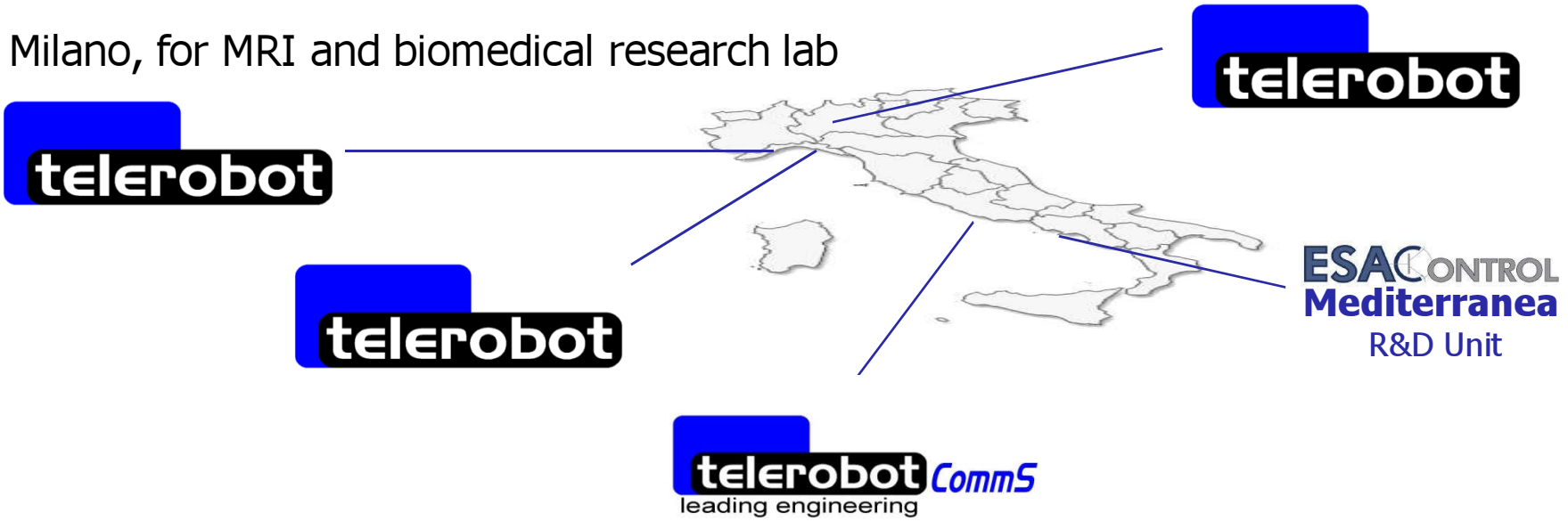
Telerobot Ocem has four sites:

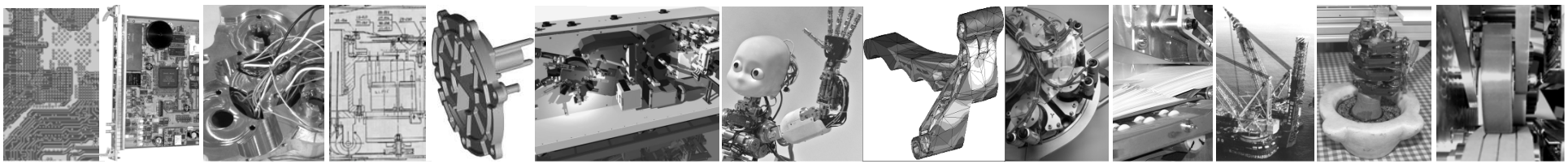
Genova, for engineering services for automation, robotics and production of complex and small mechatronic systems;

Latina, for HW/Chip/RF/optical IFs/SW/FW design;

Savona, for manufactoring and production of medium and big sized systems.

Milano, for MRI and biomedical research lab





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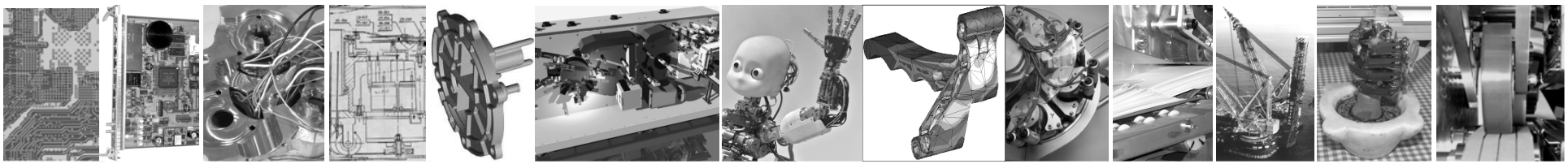
What we offer:



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WHAT WE OFFER

- ***A "solution oriented" and "Client Centered" approach***

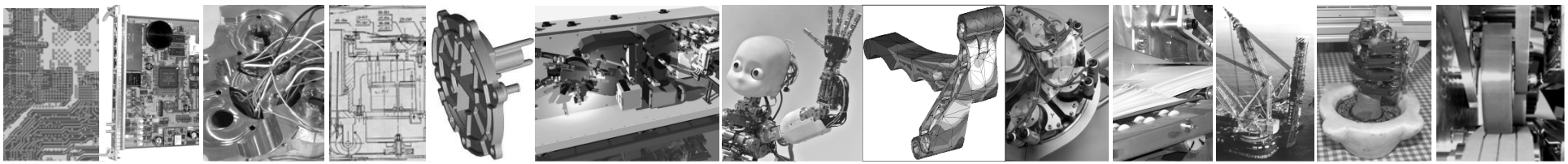
- ***Highly qualified human, technical and management competences***

- ***A reliable and well-known expertise in developing and engineering products***

- ***A multi-disciplinary approach and a huge engineering background***

- ***Experience in facing problems in complex and not standard scenarios***

- ***A high quality network of collaborators***



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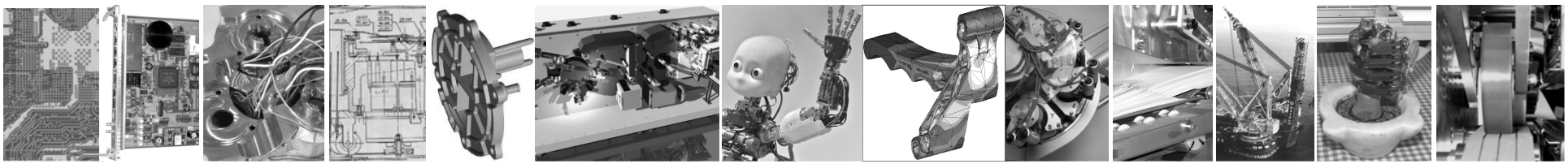
What we are searching for:



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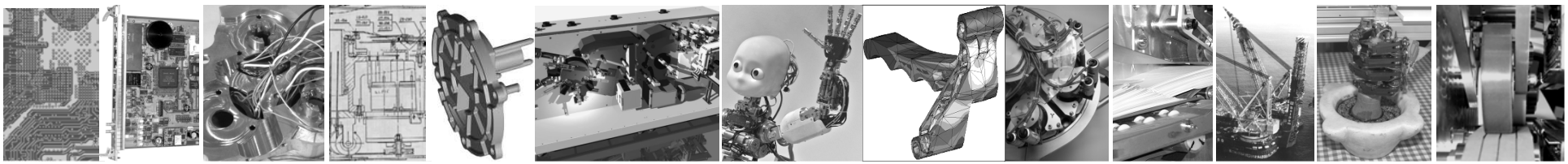
- ***Companies that require technical support in the development and innovation of products***

- ***Companies that are searching for an european partner in Italy for developing novel businesses together***

- ***R&D Project teams – both from Academy and Industry- who are interested in TLR as technical partner***



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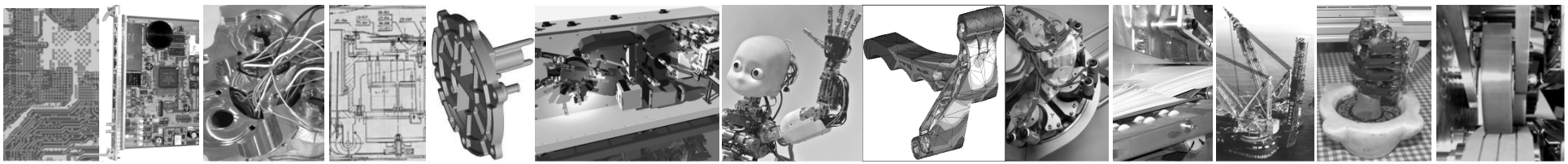
Our achievements:



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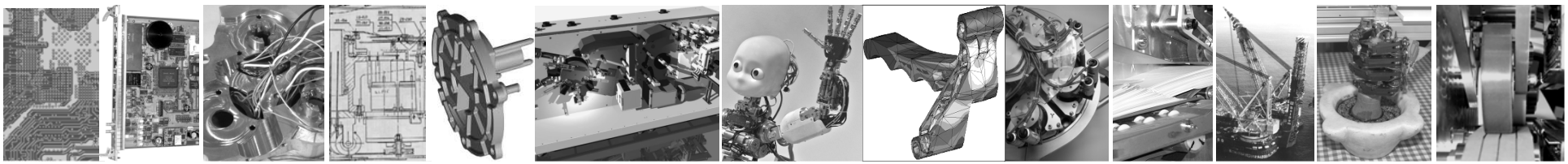
OUR ACHIEVEMENTS

- **Teleoperated robots in harsh environments**
- **Advanced vision systems**
- **OFF-SHORE Systems**
- **Humanoid Robotics**
- **Advanced biomedical devices**
- **Industrial Automation**



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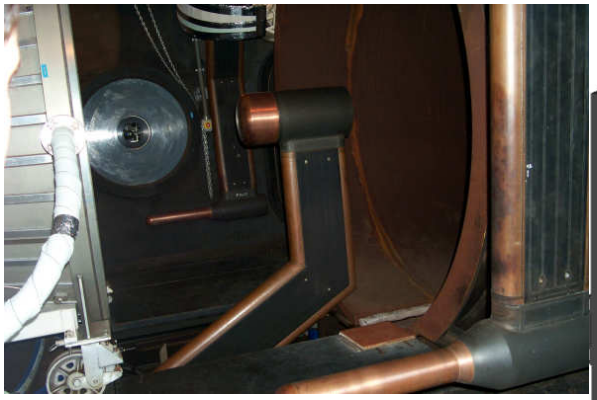
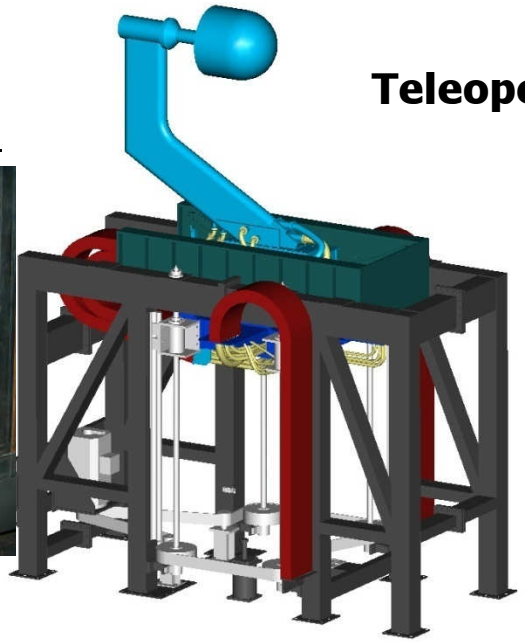
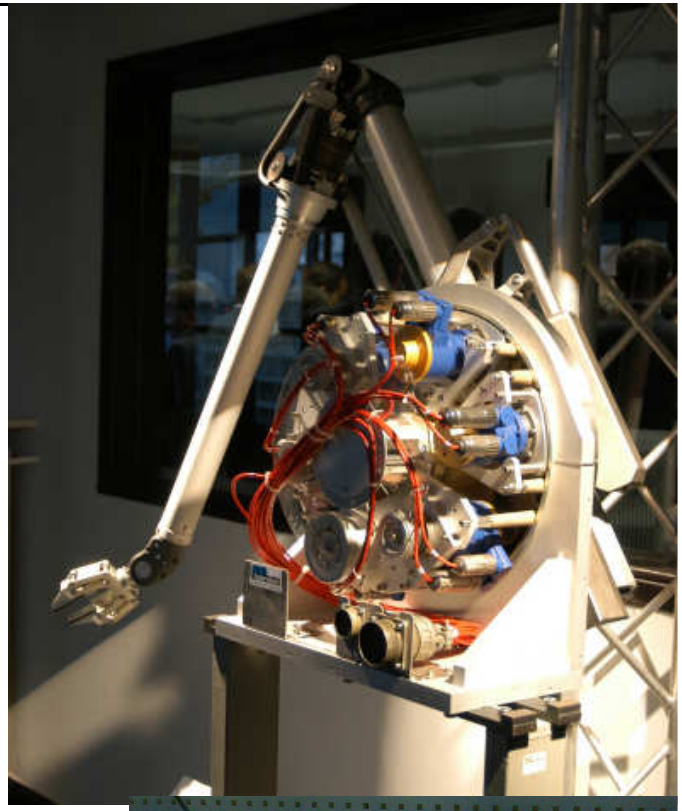
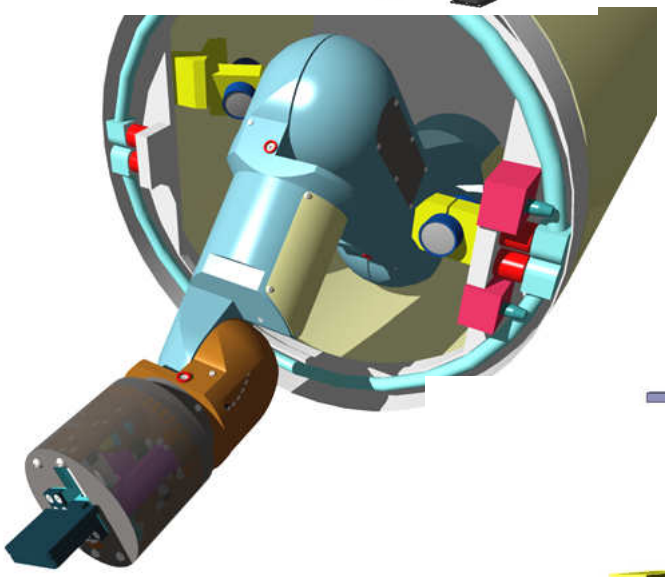
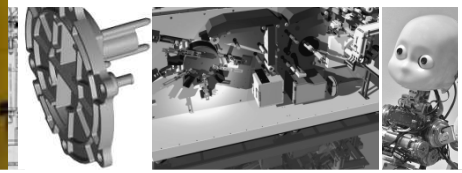
Teleoperated robots in harsh environments

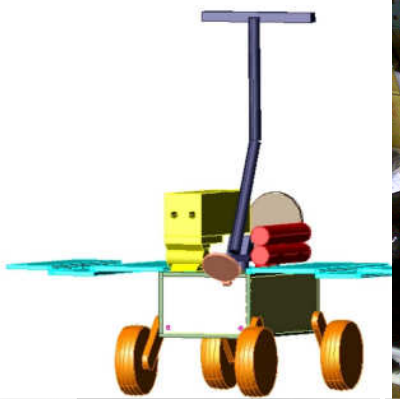












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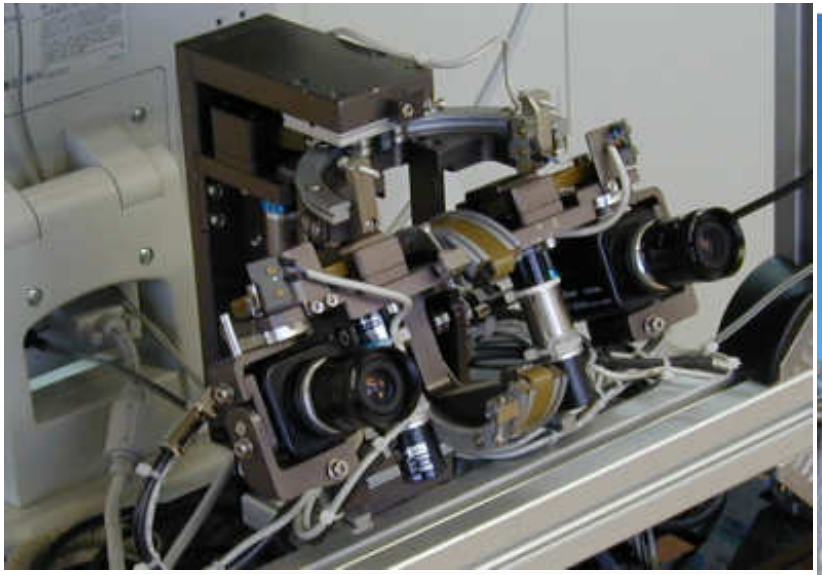
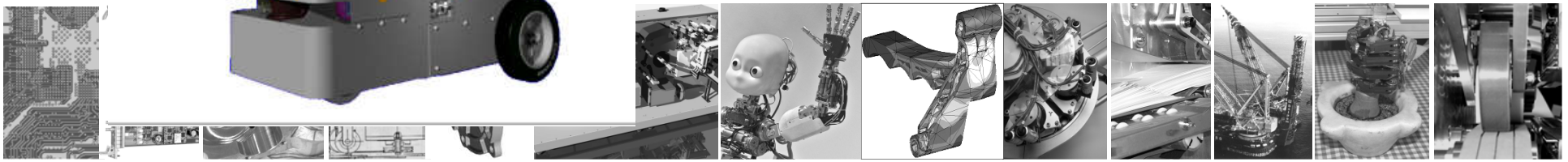
Advanced vision systems





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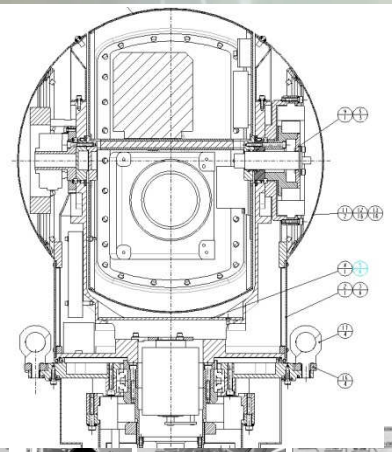
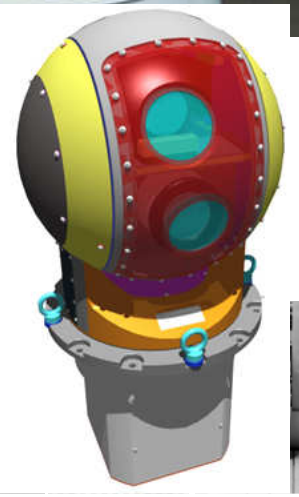
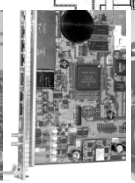
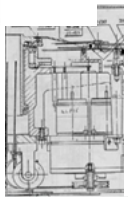
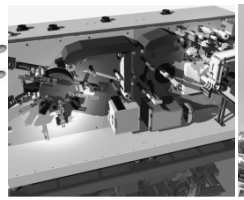
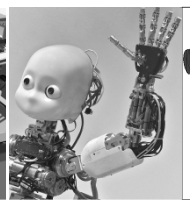
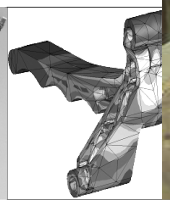
medusa turret MK4 for SELEX S.I. (former AMS)









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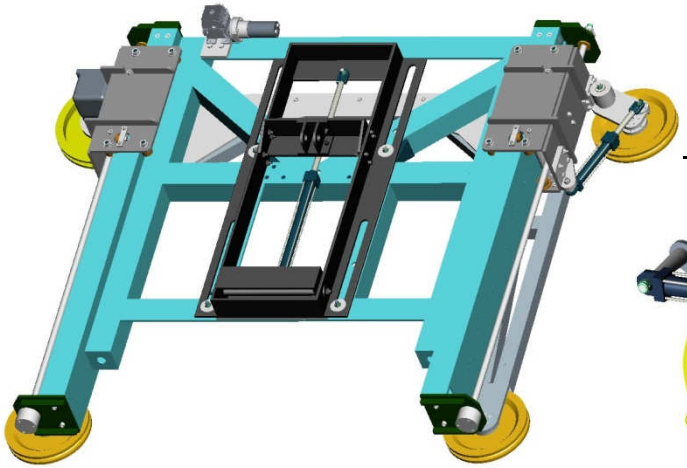
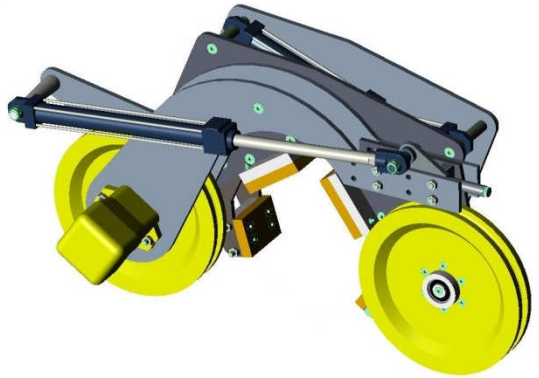
OFF-SHORE Systems





CIRCLE

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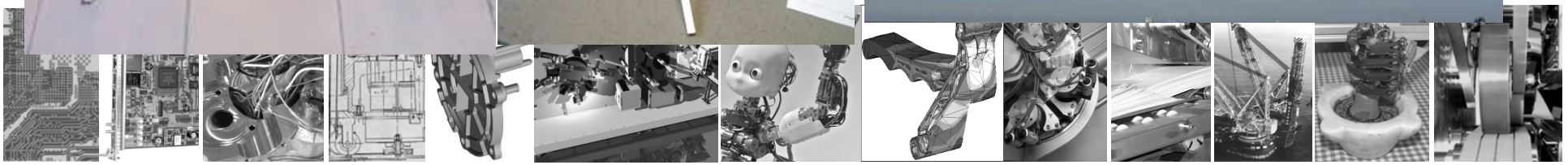
OFF-SHORE systems for SAIPEM/ENI



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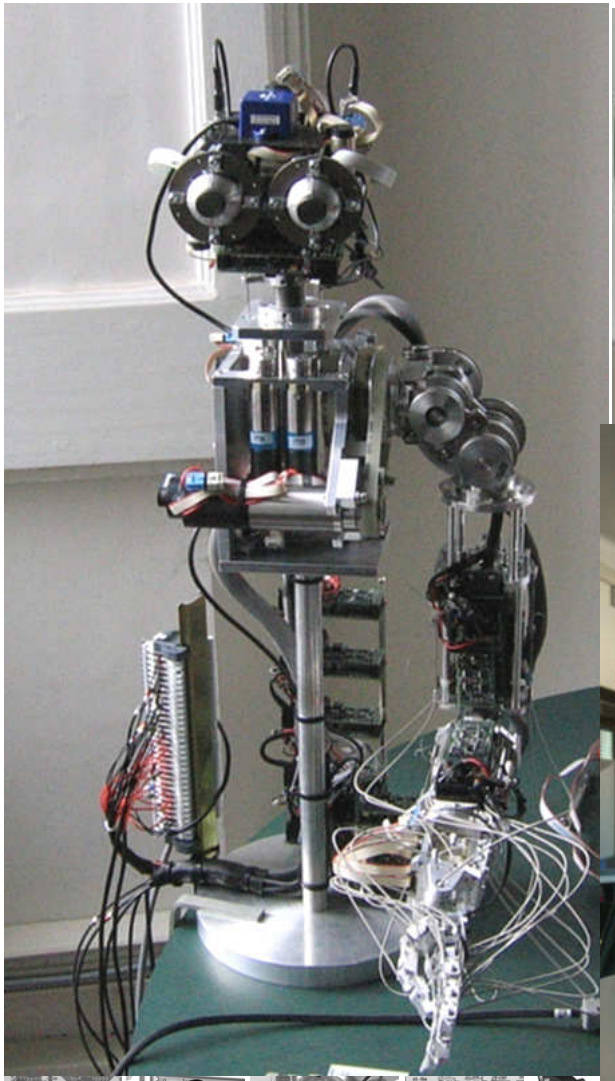
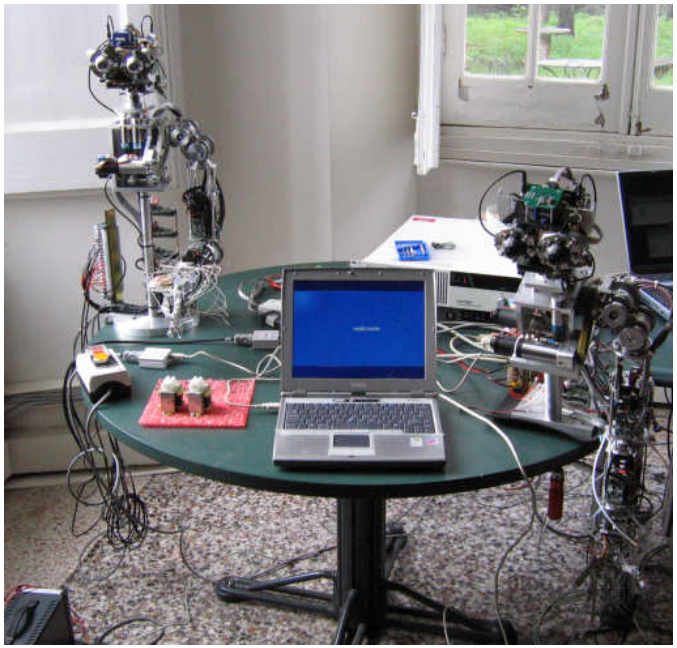
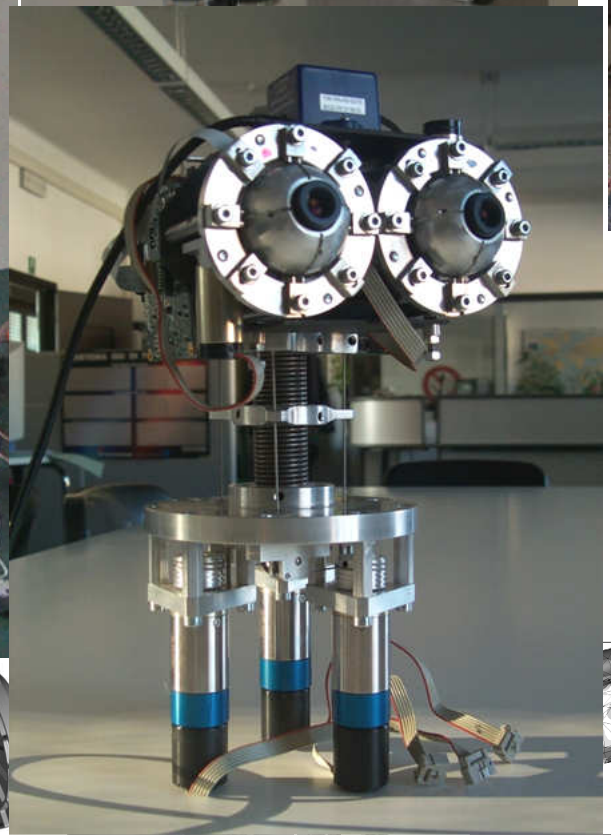
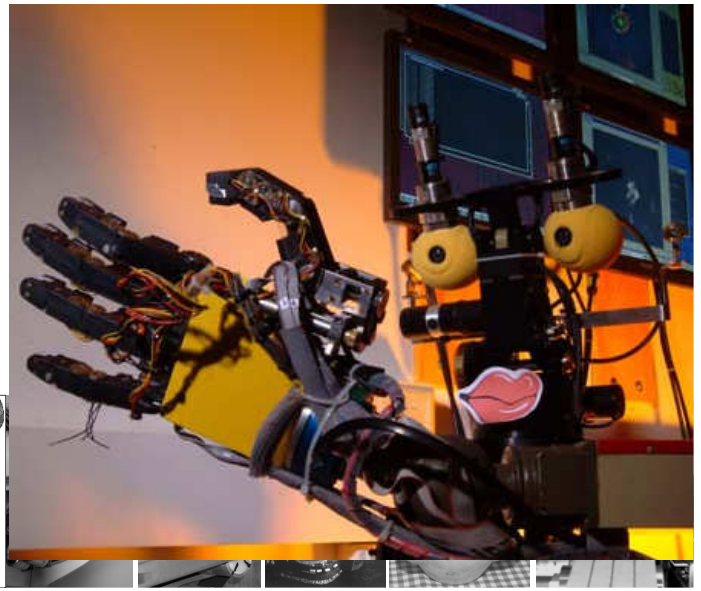
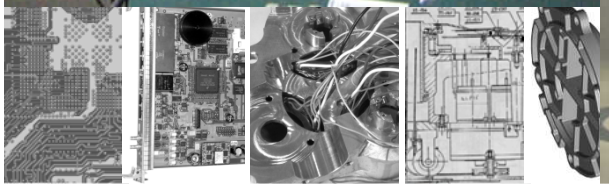
Humanoid Robotics











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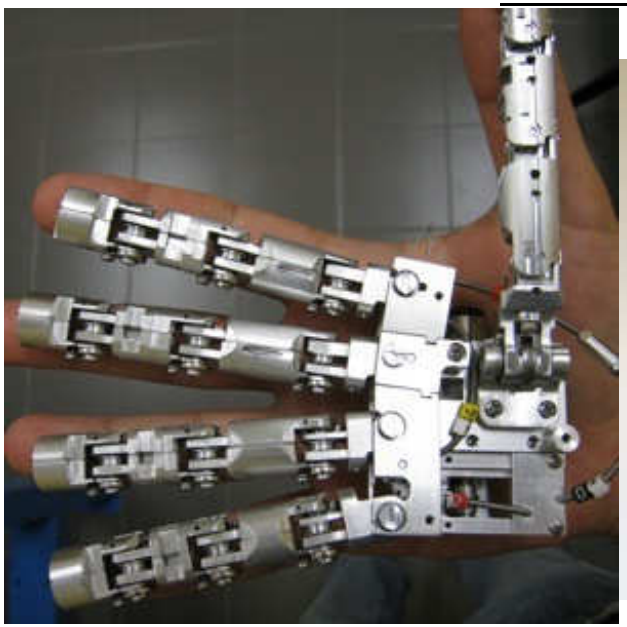
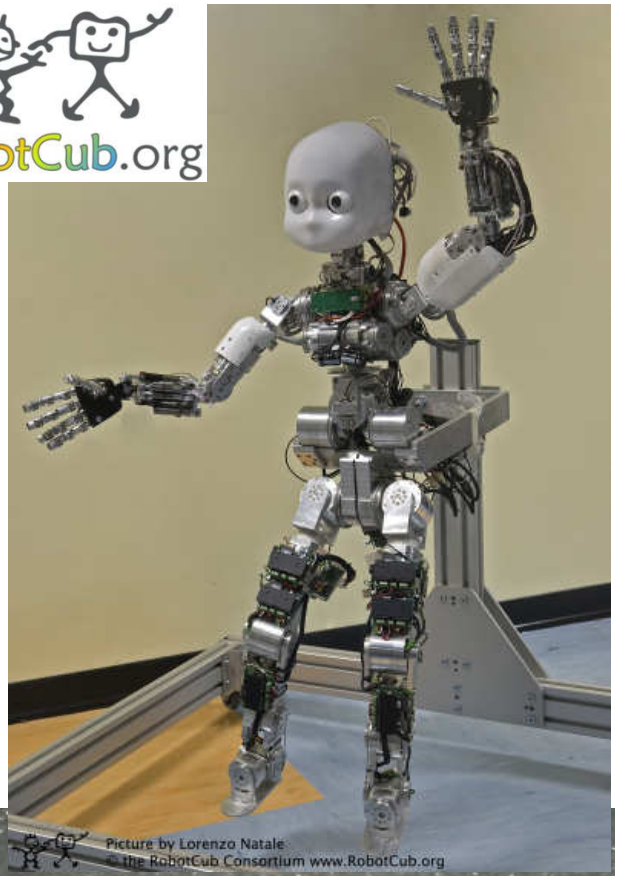
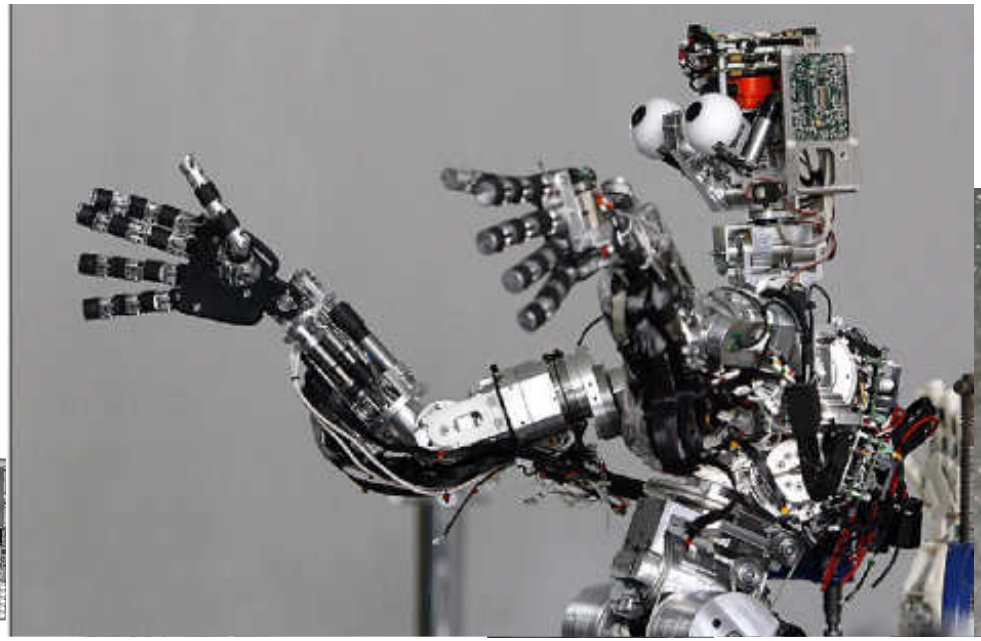
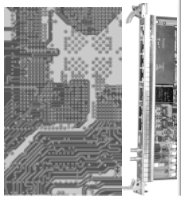
iCub: the european robotic child

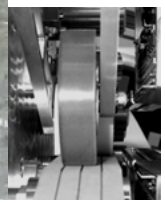


RobotCub.org









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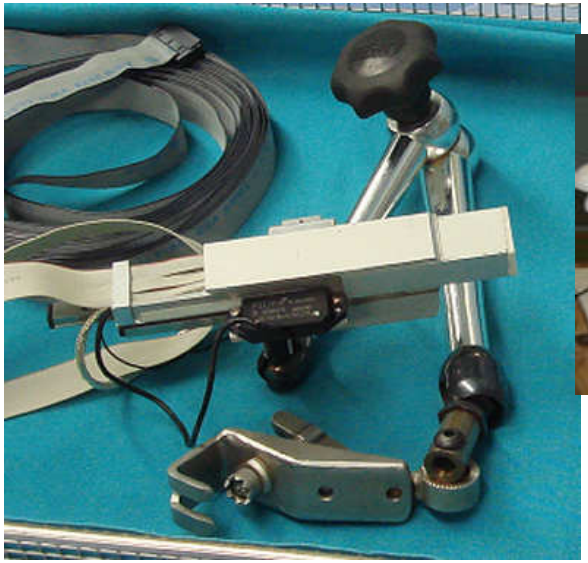
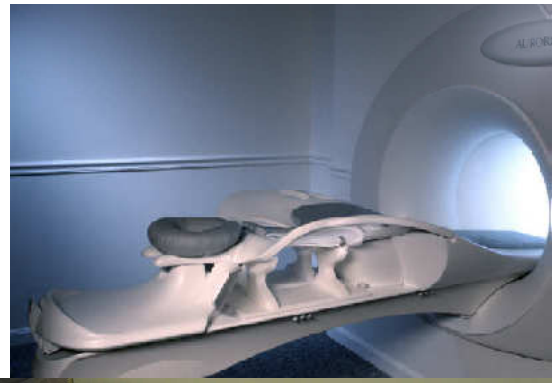
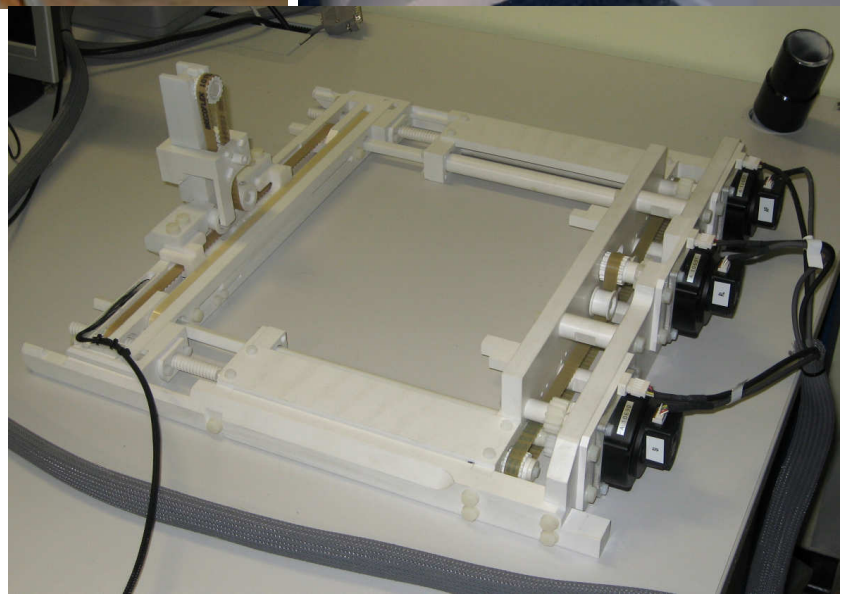
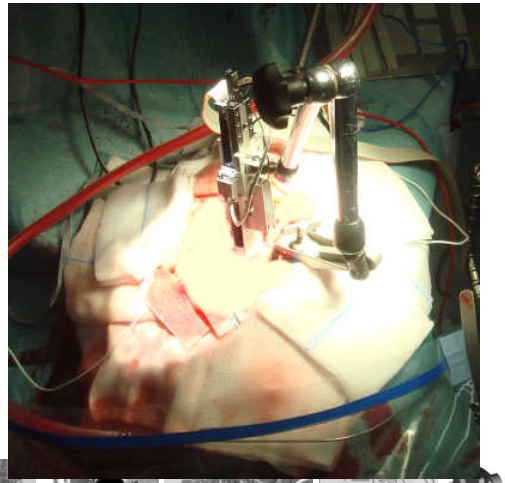
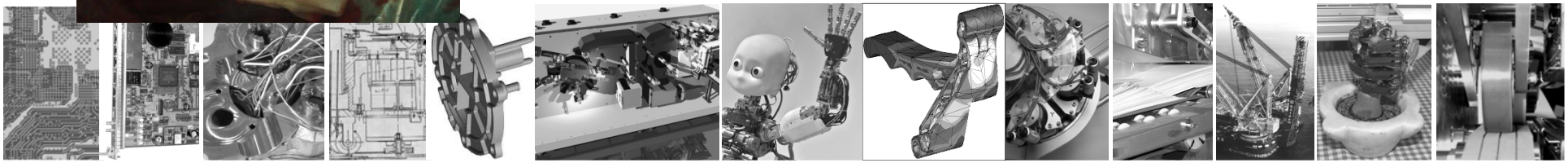
Advanced biomedical devices



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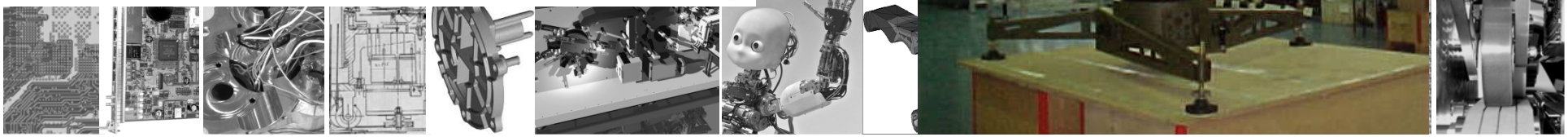
Automated WorkCells ELSAG DATAMAT, antennas EHF/WBDL for SELEX COMMS



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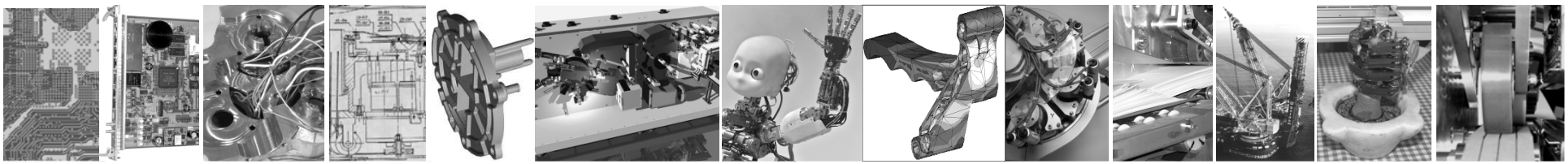
Our products:



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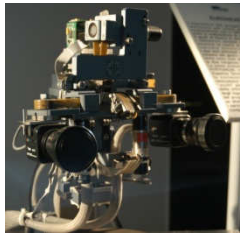
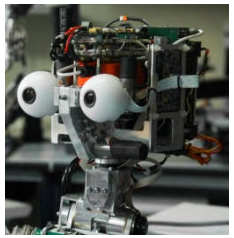
OUR PRODUCTS



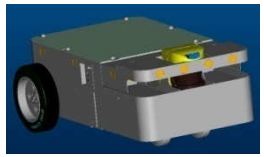
•TLR Head EUROHE4D: 4 DoF Head for Stereo Vision



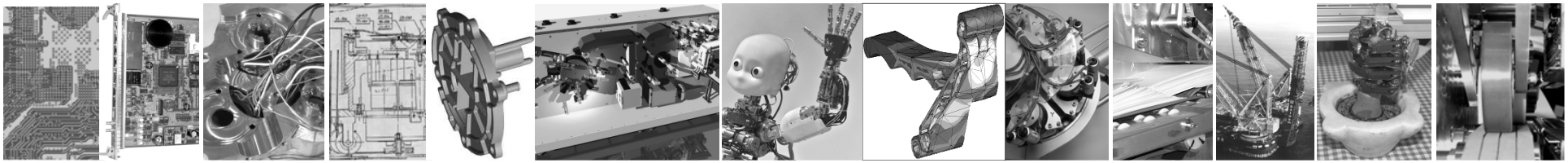
•iCub head: 6 DoF Humanoid Head for Stereo Vision

•TLR LightArm TLA_850: 7 DoF LightWeight Arm

•TLR Hand TLH_6: 6 DoF intrinsic actuated and fully integrated compliant hand SOON AVAILABLE!!



•TLR Stroll TLV_100: Mobile Platform SOON AVAILABLE!!



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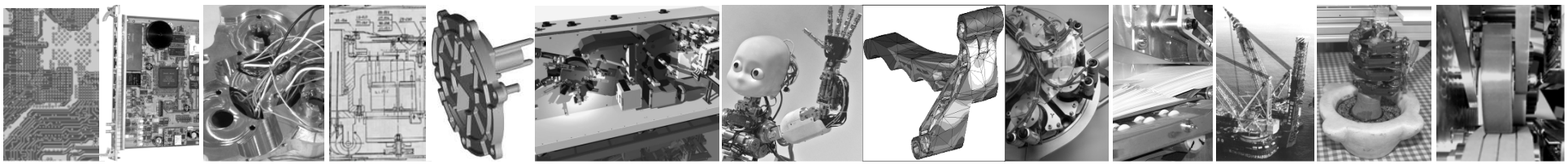
Our proposal in the ECHORD framework:



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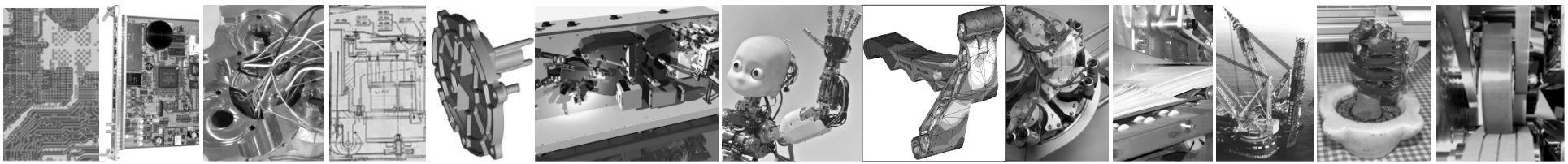
ECHORD ISSUES

Scenarios

1. Human-Robot Co-Worker
2. Hyper-Flexible Cells Scenario
3. Cognitive Factory

Research Foci

1. Human-Robot Interfacing and Safety
2. Robot Hands and Complex Manipulation
3. Mobile Manipulators and Cooperation
4. Networked Robots



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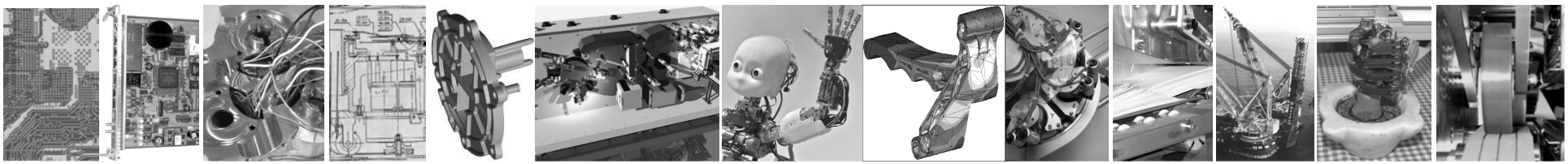
TLR SELECTION

Scenarios

1. Human-Robot Co-Worker
2. Hyper-Flexible Cells Scenario
3. Cognitive Factory

Research Foci

1. Human-Robot Interfacing and Safety
2. Robot Hands and Complex Manipulation
3. Mobile Manipulators and Cooperation
4. Networked Robots



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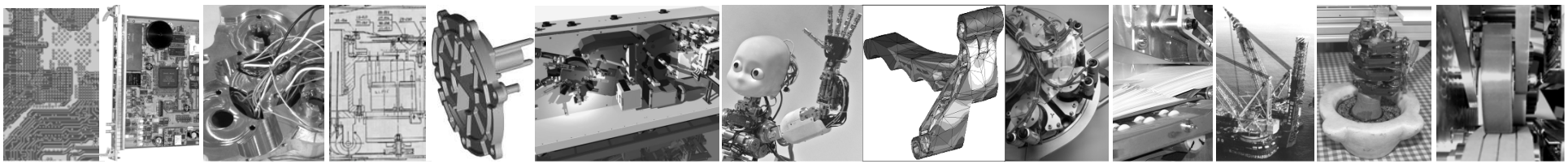
SUGGESTED SCENARIOS

Suggested Scenarios

- Robot on a fix platform
  - Human-Robot Co-Work
- Robot on a mobile platform
  - Robotic Logistics
  - Robotic assistance for post-stroke and tetraplegic patients
  - Robot Worker



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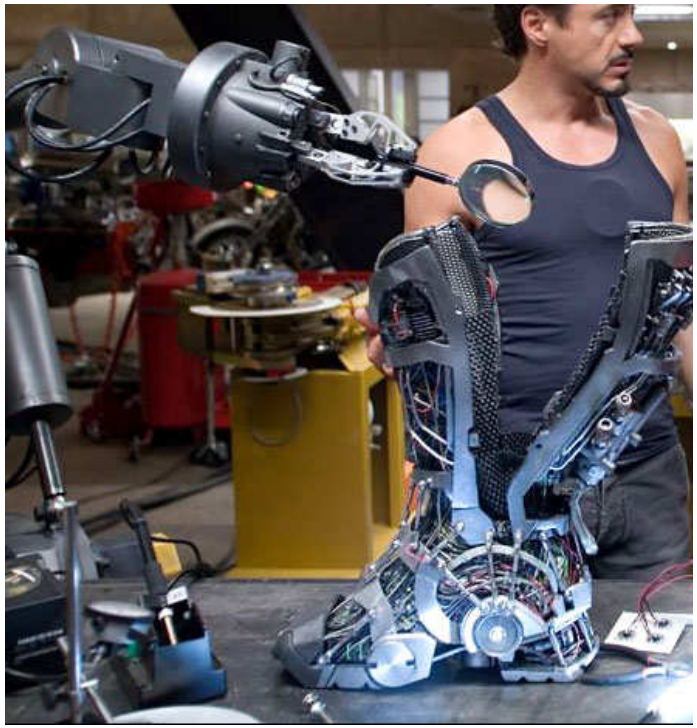
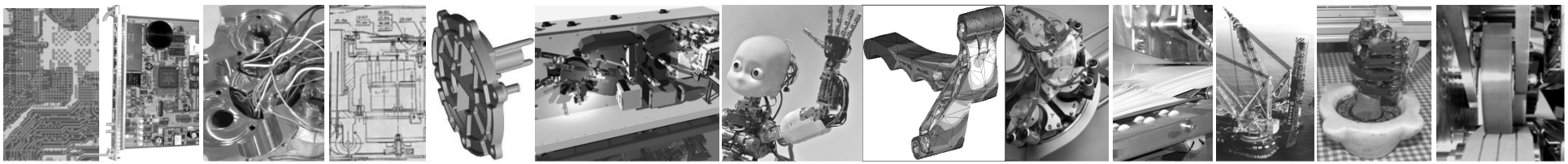
ROBOT ON A FIX PLATFORM

Human-Robot Co-Work

Research Issues



1. Intrinsic safety
2. Dependability
3. Learning through demonstration
4. Features recognition
5. High-level Control interaction



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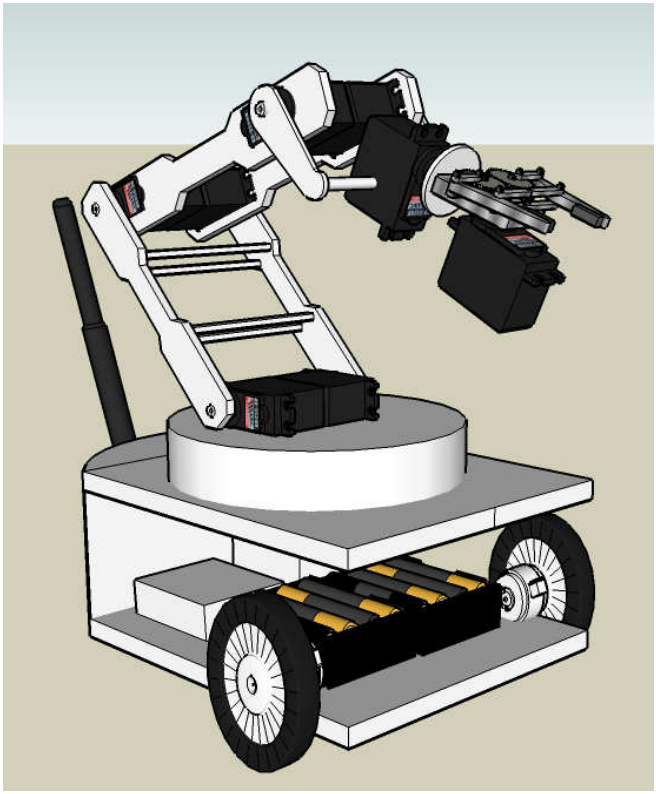
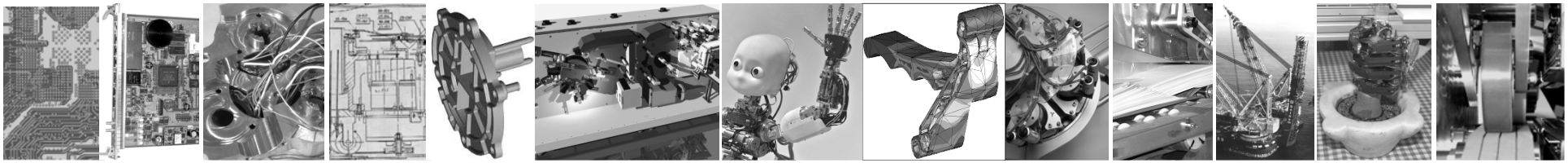
ROBOT ON A MOBILE PLATFORM

Robotic Logistics

Research Issues

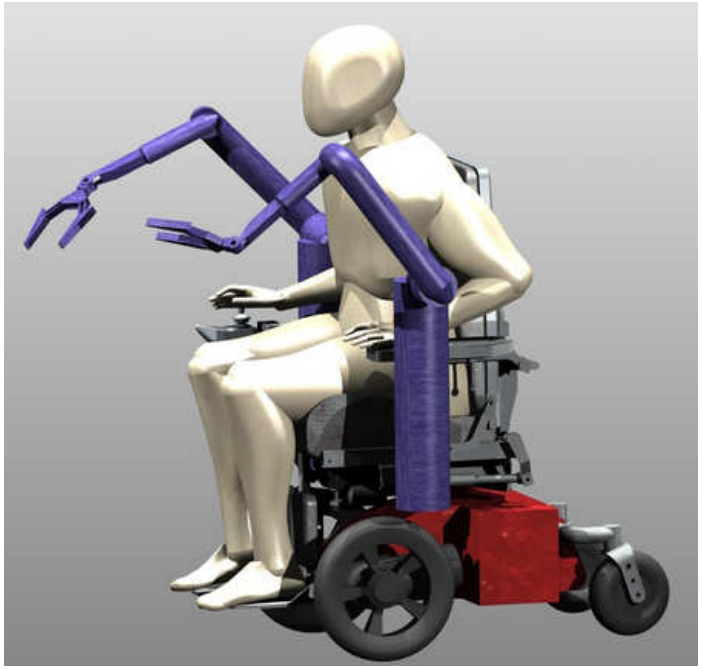


1. Real-time 3D Mapping
2. Navigation
3. Object/feature recognition
4. Environment interaction
5. Obstacle avoidance

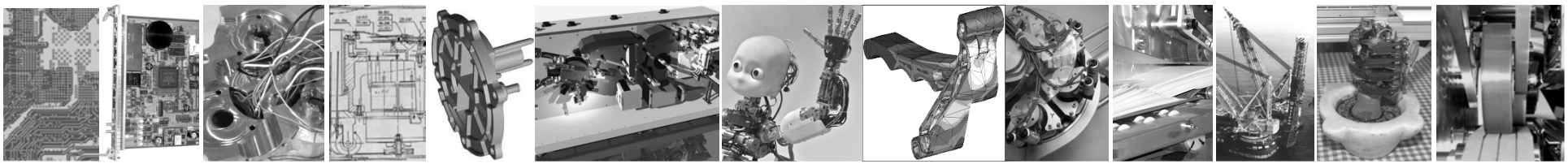


ROBOT ON A MOBILE PLATFORM

Robotic assistance for post-stroke and tetraplegic patients

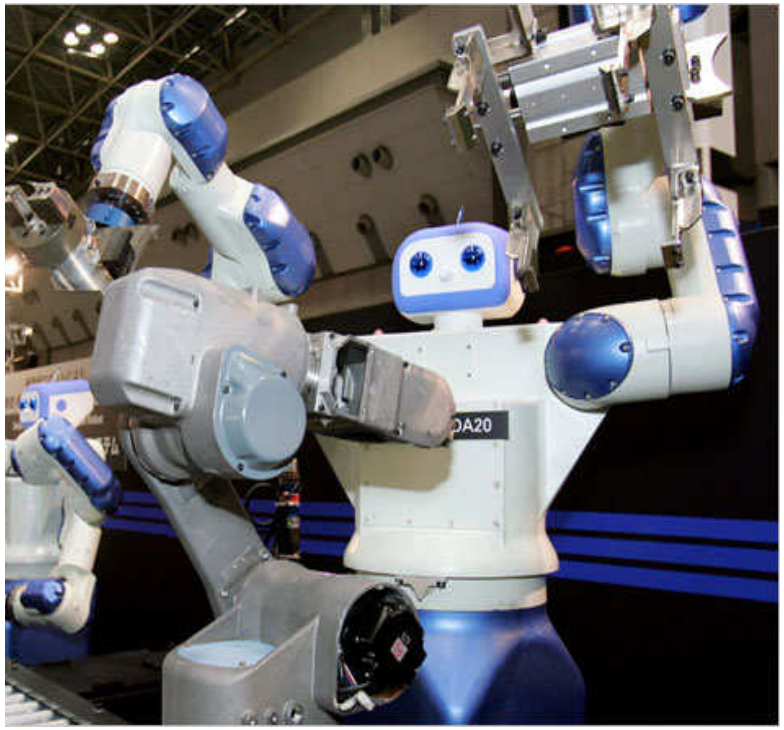


1. Intrinsic safety
2. Dependability
3. AI algorithms for User's target identification
4. Features recognition
5. High-level Control interaction

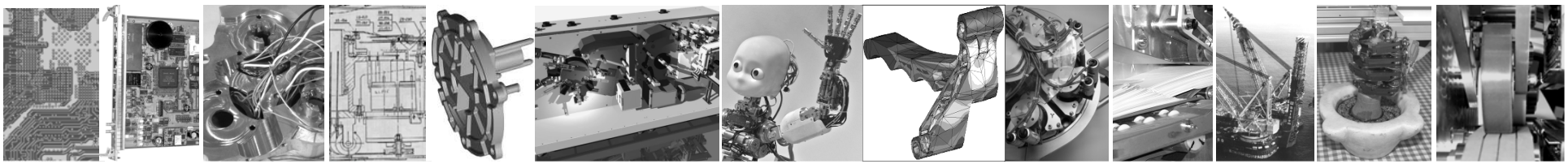


ROBOT ON A MOBILE PLATFORM

Robot Worker



1. Intrinsic safety
2. Dependability
3. Learning through demonstration
4. High-level Control interaction
5. Real-time Mapping
6. Navigation
7. Object/feature recognition
8. Environment interaction
9. Obstacle avoidance



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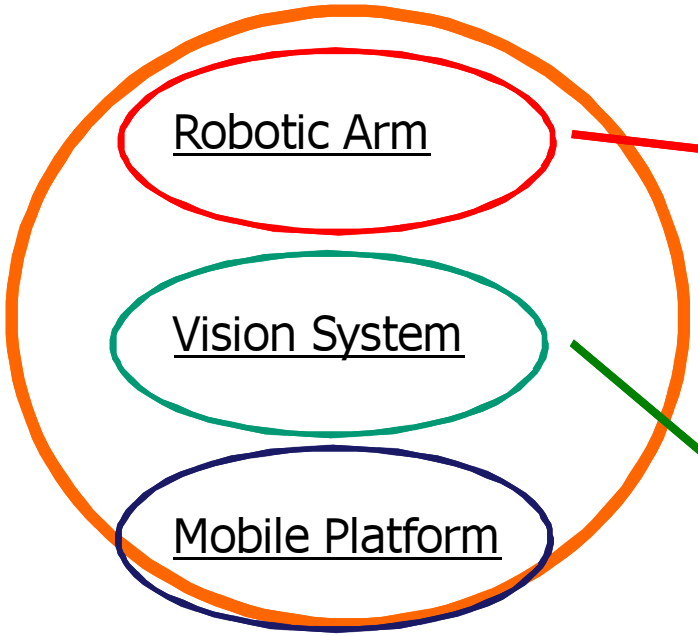
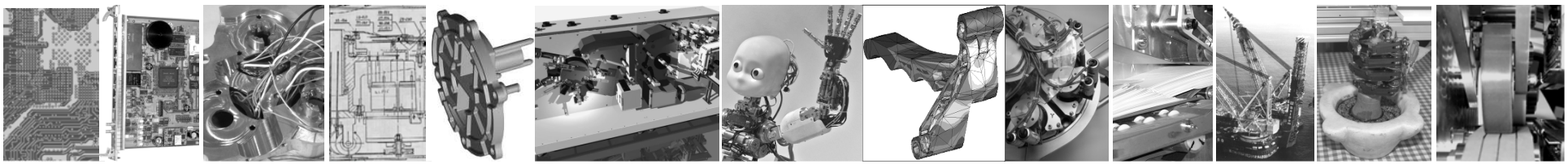
SUITABLE HARDWARE



- Flexible
- Lightweight
- Intrinsically safe
- Reliable

- Reliable
- Stereo
- Stable
- Adaptable to environment changes

- Reliable
- Adaptable to system inertia changes
- Adaptable to environment changes



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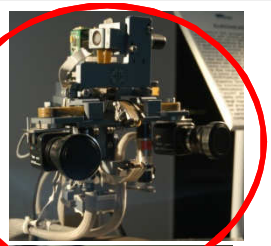
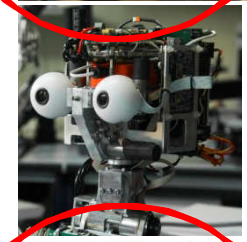
OUR PRODUCTS



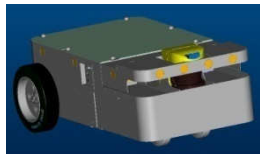
•TLR Head EUROHE4d: 4 DoF Head for Stereo Vision



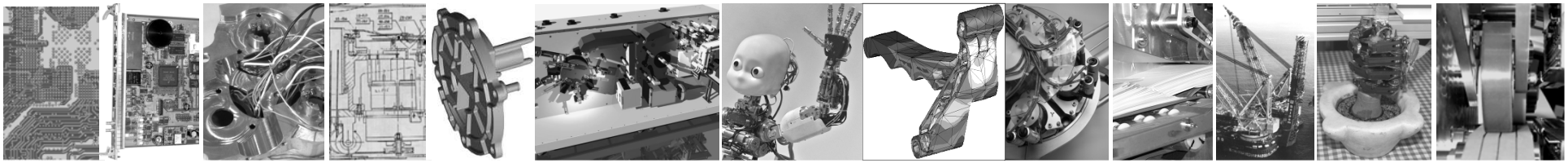
•iCub head: 6 DoF Humanoid Head for Stereo Vision

•TLR LightArm TLA_850: 7 DoF LightWeight Arm

•TLR Hand TLH_6: 6 DoF intrinsic actuated and fully integrated compliant hand SOON AVAILABLE!!



•TLR Stroll TLV_100: Mobile Platform SOON AVAILABLE!!



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TLR LIGHTARM

TLR LIGHTARM TLA_850

•Anthropomorphous Modular Arm

•Structure: Anodized Aluminum

•Controlled axes: 7

•Max distance Basement-End Effector: 850 mm

•Repeatability +/- 0.5 mm

•Approximate mass < 15 Kg

•Maximum speed: 90 deg/sec for each joint

•Standard Protection IP30

•Payload > 7.5 Kg

•Motor Controller: DSP on board at each modular joint; CAN bus connection.

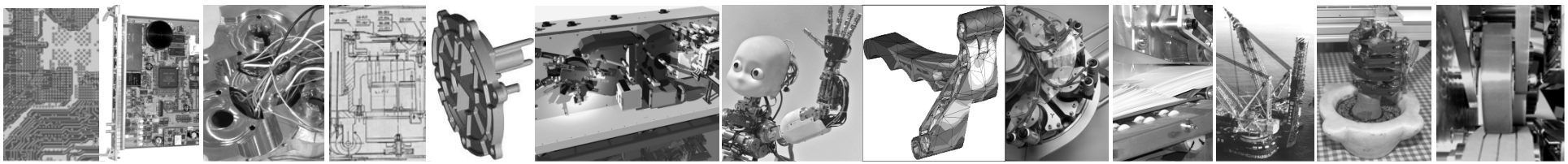
•Communications: maximum baud rate 1 Mbit/sec, version DS 301 V4.01; layer setting service and protocol support DS 305; device profile (drive and motion control) DS 402

•Each joint controlled in position, velocity and torque

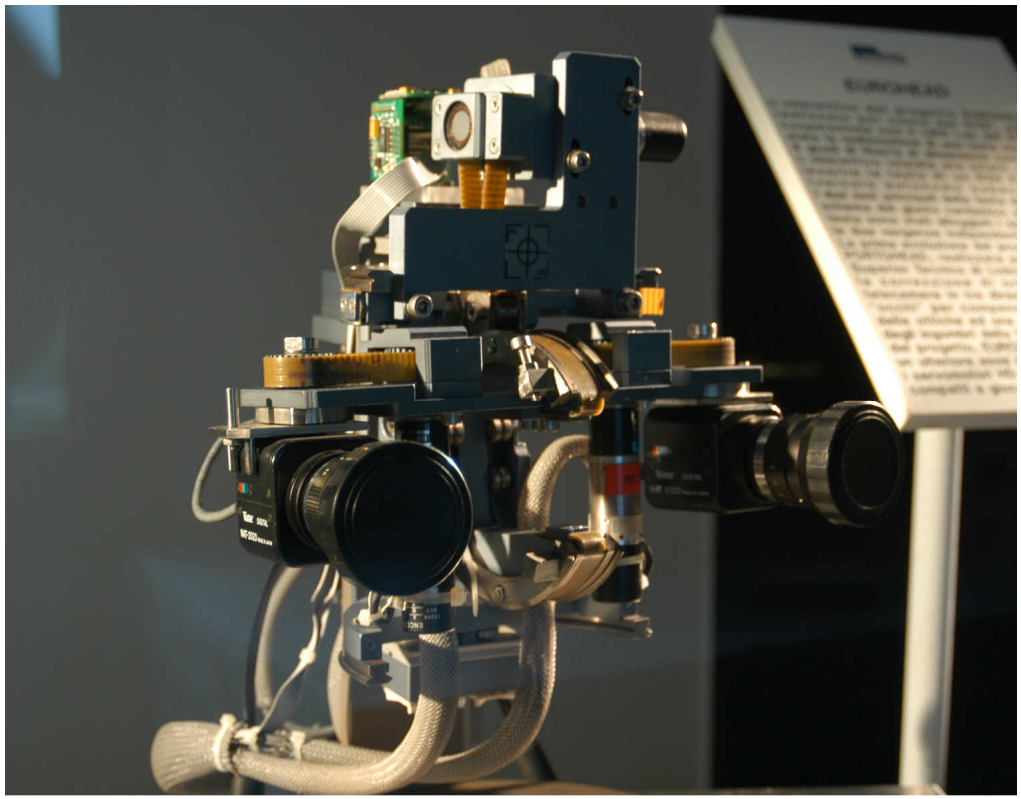
•Modular design compatible with a gripper and a 6 DoF load cell (both items available on demand).

•Designed to work also on mobile platforms

•Required voltage: 24 V DC

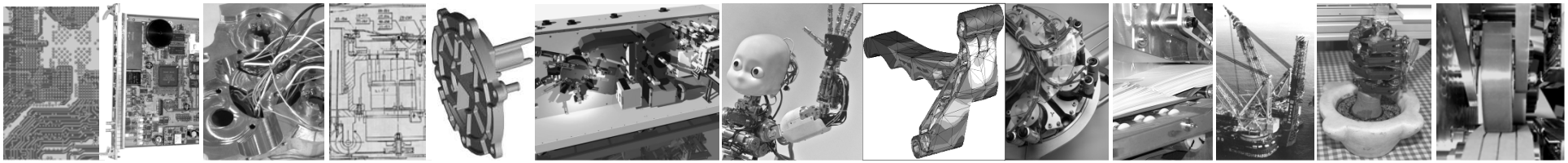


TLR HEAD



TLR HEAD TLHE_4

- 4 DoF: Tilt, Vergency (Independent, 2 DoF) and Neck Pan
- Structure: Anodized Aluminum
- Weight: 2.5 Kg
- Controlled axes: 4
- Harmonic Drives Gearboxes
- DC Motors
- Good dynamics
- Required voltage: 24 V DC
- Motor Controller: DSP on board; CAN bus connection
- Designed to work also on mobile platforms



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…Thank you for your attention

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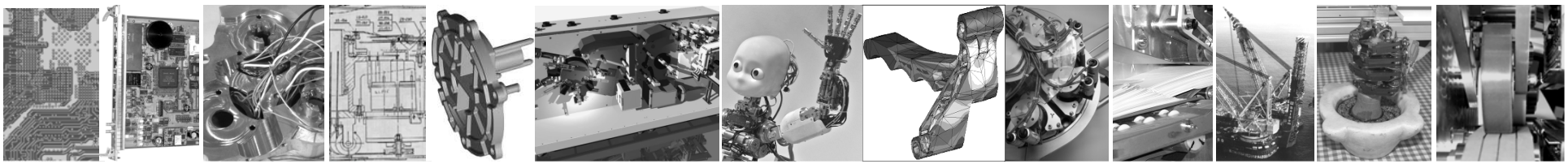
ISO 9001
BUREAU VERITAS
Certification

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