

THE BIOROBOTICS
INSTITUTE



Scuola Superiore
Sant'Anna

Equipment available at The BioRobotics Institute and associated Labs

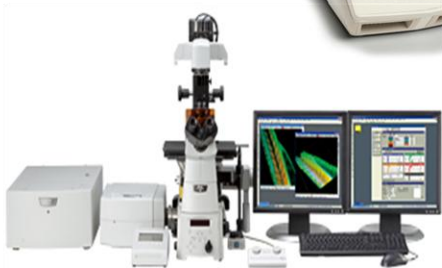


Table of Contents

Workshop	3
Clean Room.....	7
Measurement Lab	13
Chemical Lab	15
Cell Culture Lab	18
Polymer Lab	25
Artificial Hands Area.....	27
FUTURA & Wet Lab	30
MareLab - Senly Room (Florence)	33
Research Centre on Sea Technologies and Marine Robotics (Scoglio della Regina - Livorno).....	35
Rehabilitation Bioengineering Laboratory (Volterra).....	36

Workshop

Lathe – EMCO, EmcoMAT 17 D

Conventional lathe. It is a machine tool which rotates the workpiece on its axis to perform various operations such as cutting, sanding, knurling, drilling, or deformation, facing, turning, with tools that are applied to the workpiece to create an object which has symmetry respect to a rotation axis.



Milling machine – Eumega, MDV4S

Equipment to perform milling processes. Rotary cutters are used to remove material from a workpiece advancing (or feeding) in a direction at a certain angle with respect to the tool axis.

Machining center – Hurco, VM1

CNC vertical machining center with 3 axes. VM1 has the following features: work space: X = 670 mm, Y = 360 mm, Z = 430 mm; accuracy: 5 μ m; spindle speed: 10 000 RMP.





Micro-milling machine – Kern, HSPC 2522

CNC micro-milling machine with 5 axes. This machine is suitable to fabricate mechanical components with high precision. It has accuracy, on all axes, of 1 μm .

Electrical discharge machine – Sodick, AP200L

Electrical discharge machining (EDM), it can perform a manufacturing process whereby a desired shape is obtained using electrical discharges. It can manage very hard metals with the accuracy of 1 μm .



Electrical discharge machine – Sarix, SR-HPM T1-T4

Electrical discharge machining (EDM). Its common uses are for precision EDM. It allows hole drilling (below 0.250 mm diameter).



Band-saw – Carif, 260BSA

Conventional band-saw, completely hydraulic, featured by small dimensions and high robustness. It has a blade motor (1.1/1.4 KW) that can perform cutting tasks at $-45^{\circ}/+60^{\circ}$ orientation.





3D Printer – 3D System, Projet HD 3000

3D printer. It is suitable to print durable, precision acrylic parts ideal for rapid prototyping and functional testing. Accuracy: $\sim 50 \mu\text{m}$, build volume: $298 \times 185 \times 203 \text{ mm}$.

Measuring machine – Werth, Video-Check-EA

Video-Check-EA is a multi-sensor measuring machine. The measurement work space is: X = 400 mm, Y= 200 mm and Z= 250 mm; the volumetric accuracy is $2 \mu\text{m}$.



Micro injection molder – BATTENFELD, Microsystem 50

Equipment allowing the production of precision macro- and micro-components made of plastics. It has been conceived especially for small components.

Testing machine – Instron, 4464

Electromechanical testing machine. It is suitable for static mechanical tests in tensile or compression mode within a single frame. Two different load cells are available with two different full-scale ranges, respectively: $\pm 1\text{kN}$ and $\pm 10\text{ N}$.



Furnace – Carbolite, CSF 1200

Furnace used for high-temperature heating it can reach temperature up to $1200\text{ }^{\circ}\text{C}$. This furnace is particularly suitable to shape nitinol alloys (e.g. for the development of smart actuators).

Stove – Galli, G-therm 075

Thermostatic stove with forced ventilation.



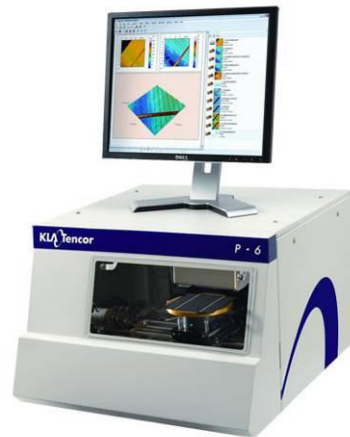
Welder – Lampert, Puk 4.1

Welding device for automatic welding processes. It allows very simple and reproducible task execution. With this device it is possible to use different materials, such as aluminum, gold, silver and steel.

Clean Room

StylusProfiler - KLA-Tencor, P-6

It allows to perform thin films thickness measures and to quantitatively measure 2D and 3D surface roughness. It is based on a diamond stylus entering in touch with the analyzed surface. The precision scan stage design enables high quality scans over the entire 6 in. sample stage area with up to 150 mm scan length and 1 mm Z range.



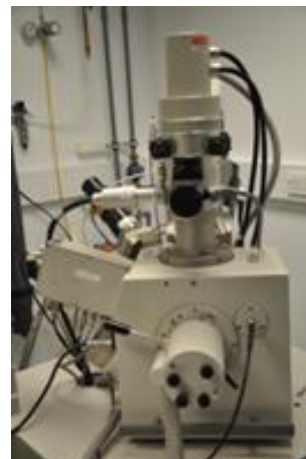
SEM with Microanalysis - Carl Zeiss AG / Oxford instruments EVO MA10 / Incax-act

It produces images of a sample by scanning it with a focused beam of electrons. Thanks to a Silicon Drift Detector microanalysis, it allows also to identify sample constitutive materials. The device shows a 0.2 - 30 kV acceleration voltage, it is provided with a secondary electron detector and a backscattered electron detector.



Focused Ion Beam - FEI FIB 200

This 30 kV FIB produces images of a sample by scanning it with a focused beam of ions and it can be used also as a micro- and nano-machining tool. It exhibits a 10 nm imaging and milling resolution and it is compatible with Nanomanipulator workstations. The machine enables also Pt, SiO₂ deposition and Enhanced Etch beam chemistries.





Dual Beam - FIB/SEM FEI HELIOS NANOLAB 600i

By combining a 350 V - 30 kV SEM and a 500 V - 30 kV FIB, it is the preferred solution for 3D microscopy and analysis serving material characterization, industrial failure analysis and process control applications. The instrument enables also low kV FIB operation, FE SEM analysis, STEM microscopy, EDS, WDS, and EBSP analysis, and is provided with Omniprobe™ sample extraction for microanalysis.

Langmuir-Blodgett System - KSV NIMA KSV 5000

This double trough system can be used to compress monolayers of molecules on the surface of a given sub-phase (usually water) and to measure surface phenomena due to this compression, or to deposit single or multiple alternated monolayers on a solid substrate. The maximum trough surface area is 775 × 120 mm for substrates up to 100 × 100 mm.

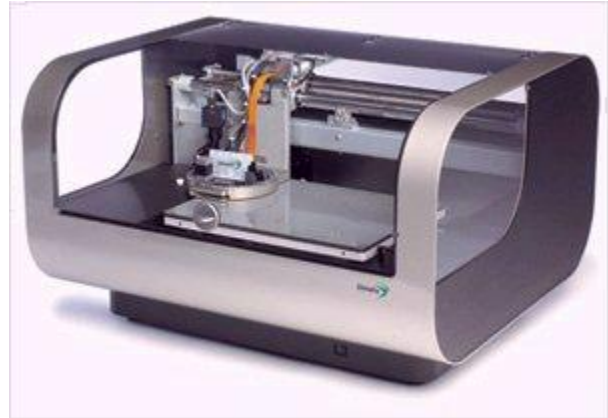


Direct Laser Writer - NanoScribe GmbH, Nanoscribe

This instrument enables 3D microprinting and maskless multi-photon absorption lithography with submicron resolution. It works both with specific and traditional photoresists and it is provided with an autofocus interface.

Materials Inkjet Printer - FUJIFILM Dimatix, Inc., DIMATIX DMP-2800

This printer, based on piezoelectric inkjet technology, enables protein, polymer and nanoparticle jetting on samples up to 210 x 315 mm. It is provided with a drop jetting and alignment camera and exhibits 1-10 pL drop volume.



Wet bench - Arias GmbH

Placed in a Class 1000 environment, this Wet Bench is provided with ultrasound bath, spin coater/drier, hot plate, chemical baths, gas/water guns and chemical hood.

Mask Aligner - Suss Microtech GmbH, MA6

This machine allows to perform high resolution (0.4 μm) photolithography by exploiting a 350 W Hg lamp. 6" Si wafers can be processed through soft or hard contact exposure.





Thermal evaporator - Tecno Service

This machine allows to perform metal and insulator thin film ballistic deposition. It is particularly suitable for microelectronics and neural interface fabrication applications.

RF/DC Magnetron Sputtering - Kenosistec Srl

This machine allows to perform metal and insulator thin film deposition. It is particularly employed for gold deposition.



Multiuse plasma system - Gambetti SpA, COLIBRÌ

It's a simple "user-friendly" bench-top system designed for cleaning, modification or surfaces activation of metallic, plastic, ceramic materials and others.

Manual Probe System - Cascade Microtech, PM5

Manual probe system for wafer and substrates up to 150 mm. Great application flexibility is ensured for DC and HF measurements, device and wafer characterization tests (DWC), failure analysis (FA), submicron probing, MEMS and opto engineering tests.





Optical Surface Metrology System - Leica, DCM 3D

The DCM 3D combines confocal and interferometry technology for high speed and high-resolution measurements down to 0.1 nm. It performs fast, non-invasive assessment of micro and nano structures of technical surfaces, in multiple configurations. The micro display confocal technology, with no moving parts, measures a variety of materials and provides confocal and bright field images simultaneously.

Single wafer spin coater – SPS-EUROPE, SPIN 150

It performs uniform thin film deposition onto flat substrates. Speed, time and ramp parameters can be set in order to properly tune the spinning procedure.



Digital Wedge Bonder - Kulicke&Soffa, 4523AD DIGITAL

Suitable for every gold ball bonding applications, including: Optoelectronic Modules, Hybrid/MCMs, Microwave Products, Discrete Devices/Lasers, Chip-on-Board. It allows individual bonding parameter control, it can work in semi-automatic operation modes and with a wide range of wire diameters enabling ease of use in ball bonding, ball bumping, coining, security bonding and single-point TAB applications.

**Nanomanipulator - Micro Probe Station,
Kleindiek Nanotechnik**

System for controlled manipulation at the nanoscale.



**Thin film reflectometry system - Ocean
Optics, NANOCALC**

NanoCalc is a versatile and configurable thin film measurement system based on spectroscopic reflectometry to accurately determine optical or non-optical thin film thickness.



Measurement Lab



AFM – Bruker, InNova SPM

The Innova Atomic Force Microscope (AFM) allows accurate, high-resolution imaging for advanced research in physical, life, and material sciences. This device allows to obtain 3D topographical maps of a material surface and to quantify surface-related parameters, such as roughness.

Potentiostat - Gamry Instruments, Reference 600

High performance Potentiostat – Galvanostat - ZRA for electrochemical applications. It is ideal for fundamental electrochemical studies for physical electrochemistry, corrosion measurements, batteries, coatings, nanotechnology and sensor development. It is capable to perform cyclic voltammetry, 10 μ Hz - 1 MHz EIS measurements and equivalent circuit modeling.

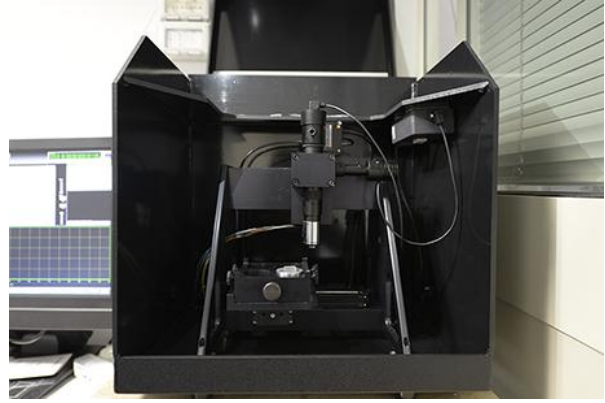


Environmental test chamber - Memmert

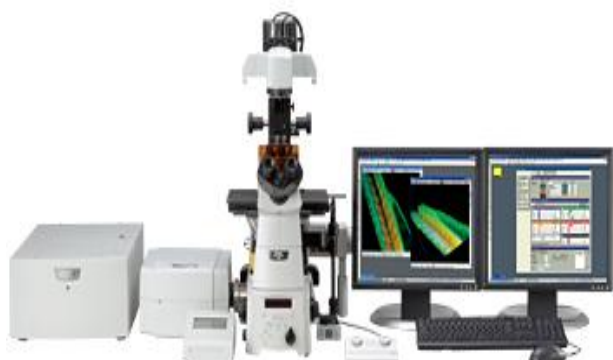
The environment chamber for temperature test and climate test simulates the desired environmental conditions and reduces the time needed for certain physico-chemical processes, through rapid temperature changes.

Nanoindenter – Nanomechanics, iNano™

Nanoindenter to perform local mechanical tests. The data acquisition speed can reach 100 kHz. It can measure up to 50 mN of force and 50 μm of displacement.



Chemical Lab



Eclipse Ti-E (Confocal Microscope) – Nikon Instruments

Confocal laser microscope system C2+/C2si, designed as an essential microscopy tool with powerful and robust imaging capabilities. Galvanometer-based high-speed scanning enables confocal imaging of fast, dynamic events in live cells using standard detectors. A high-performance imaging software NIS-Elements permits a variety of image processing and analysis functions.

Theta Optical Tensiometer – Attension-Biolin Scientific

Compact and accurate contact angle meter for simple measurements of contact angle and surface free energy. It also measures surface and interfacial tension. It enables investigation of material properties such as wettability, adhesion, homogeneity, spreading, cleanliness and adsorption.



Chemical hood – Steril, Gemini



This system is composed of a vertical laminar airflow cabinet, external surfaces epoxy powder-coated, worktop and back panel in stainless steel.

It is designed to guarantee protection from dangerous effects due to uncontrolled diffusion of air-transported contaminants during handling of chemicals.

UV-Vis spectrophotometer - Perkin Elmer, LAMBDA 45

Device allowing transmittance and absorbance measurements in the visible and UV band (190-1100 nm). It can be used with liquids, transparent solids and highly absorbing samples.



Zeta sizer - Malvern Instruments, NANO-ZS90

It is used for the size measurements (range: 0.3 nm – 10 μ m), electrophoretic mobility of proteins, zeta potential of colloids and nanoparticles, molecular weight and second virial coefficient, A_2 , of macromolecules and kD.

Differential Scanning Calorimeter - Mettler, DSC 1 STAR System

DSC measures enthalpy changes in samples due to changes in their physical and chemical properties as a function of temperature (150 °C to 700 °C in one measurement) or time. It shows great sensitivity and resolution, efficient automation and is suitable both for small and large sample volumes.



Fourier Transform Spectrophotometer - Shimadzu, DSC

Fourier transform infrared spectroscopy (FTIR) is a technique used to obtain an infrared spectrum of absorption, emission, photoconductivity or Raman scattering of a solid, liquid or gas. This instrument allows high spectral resolution data acquisition over a wide spectral range and shows full functionality for all FTIR techniques, including transmission, diffuse reflection, and attenuated total reflection (ATR).



Fluorescence Spectrophotometer - Agilent Technologies, Cary Eclipse

The Cary Eclipse Spectrophotometer uses a Xenon flash lamp to analyze the fluorescence of a sample with high sensitivity, high signal-to-noise ratio, and fast kinetics. It measures the emission of light from samples in four modes, it captures a data point every 12.5 ms and scans at 24,000 nm/min without peak shifts. It is immune to room light and offers full wavelength scanning of 384 samples.



Modular compact rheometer - Anton Paar, MCR 302

It allows to measure all the rheological properties of a fluid or polymeric material. Any type or combination of rheological tests, both in rotational and oscillatory mode, can be performed



NMR Platform - Bruker, AVANCE III HD

Nuclear magnetic resonance (NMR) spectroscopy determines the physical and chemical properties of atoms or molecules by exploiting the magnetic properties of certain atomic nuclei contained in the sample. This high dynamic range NMR allows fast acquisitions, solid state NMR analysis and simultaneous multi nuclei acquisition.



Membrane Osmometer - Gonotec, Osmomat 090

The Osmomat 090 enables the measurement of the average molecular weight (M_n) of polymers that are soluble in aqueous or organic solvents within the range of 10,000 to 2,000,000 g/Mol. acquisitions, solid state NMR analysis and simultaneous multi nuclei acquisition.



Cell Culture Lab



Multilabel Plate Reader - Perkin Elmer, VICTOR X3

Multilabel plate reader, used for the measurement of fluorescence intensity, luminescence and UV absorbance on biological and non-biological samples. This instrument allows to easily quantify properly labeled molecules, cells and compounds.

Real Time PCR – Biorad, CFX CONNECT

Device able to perform real-time polymerase chain reaction. The system includes two-target analysis, excellent thermal cycler specifications and innovative technologies to guarantee top efficiency for real-time gene analyses on biological samples.



Spectrophotometer - Thermo Scientific, NanoDrop 2000

Spectrophotometer in the range UV-Vis. Its performances regard: fast measurements (< 5 s), small sample size (0.5 μL for relatively high-concentration samples), broad concentration dynamic range (up to 15,000 $\text{ng}/\mu\text{L}$ dsDNA), capability to analyze small wavelengths (down to 205 nm).

Centrifuge - Hettich zentrifugen, Universal 320 R

Centrifuge suitable for different biological and non-biological applications. Different fixed-angle rotors and swing-out rotors can be used according to the user's requirements.



Ultrasonic homogenizers – Bandelin, Sonopuls

The SONOPULS is especially used for emulsions, homogenizations, suspensions, cell disruption and similar applications. It has an integrated amplitude control (10-100%) and actual value display, pulsation, built-in timer and remote control.

Analytical balance – Kern, ABJ-N

Analytical Balance with high-quality single-cell weighing system (down to 0.1 mg).



Vortex mixer– Velp Scientifica

The vortex allows to rapidly and effectively mix solutions, reagents and media. It features two operation modes: automatic touch mode and continuous mode. The vibration frequency can be changed in an analogic way.



Chemical hood – Asalair, Asalair Carbo 900 mod.

Chemical hood for molecular filtration, provided with an activated carbon filter.



Gel imaging system – Biorad, ChemiDoc XRS+

System for fast and sensitive chemiluminescence detection, provided with a gel imaging system, darkroom, UV transilluminator, epi-white illumination, camera and power supply.



Robotic workstation – Qiagen, QIAcube

Robotic workstation for automated purification of DNA, RNA and proteins.



Microcentrifuge – Labnet, Spectrafuge 16M

Compact high-speed microcentrifuge. A brushless, maintenance-free motor guarantee extremely fast acceleration and deceleration.



**Incubator - Thermo Scientific, Series 8000 DH
CO₂ incubator**

Incubator provided with a sterilization system that destroys microbes inside the chamber. Precise temperature control and CO₂ concentration allows flexibility for cell maintenance.



Ice machine – Km, Blueline Series IFM

Ice machine. The ice flakes are produced in a vertical cylinder and collected in a dedicated tank. The system is provided with a safety thermostat which stops the production of ice, when the maximum level is reached.

Biological hood – Sterile, Biohazard VBH

Compact cabinet provided with vertical laminar flow. Guaranteed for biohazard Class II A/B3.



Sonoporation system – Nepa Gene, SonoPore KTAC-4000



Sonoporation system allowing the cell plasma membrane permeability modulation. All parameters including frequency, power, duty pulse cycle and burst rate, can be set flexibly. The probe can be easily changed to another one with a transducer of a different size.

Ultrasonic cleaner – Branson, Branson 2510

Fast and safe ultrasonic cleaner. It is used for sample cleaning by ultrasonic waves and micro/nanoparticle dispersion in liquid solutions. It is provided with a mechanical timer and a heating system with special features to avoid overheating due to absence of liquid. Maximum power: 20 W.



Centrifuge - Hettich zentrifugenm, EBA 20

Compact and practical centrifuge for small sample volumes. It is fitted as standard with an angle rotor for 8 tubes up to a volume of 15 ml.



Water bath – Julabo, TW12

High-quality water bath with MICROPROCESSOR technology and a temperature stability of ± 0.2 °C.





Autoclave mod. 760

The autoclave mod. 760 is a steam sterilizer that generates an operating pressure of 1 atm., corresponding to a sterilization temperature of 121 ° C. The total capacity is 20 L.

Freezer – Labogene, Snowbird

-90°C ultra-freezer, for long-term maintenance of biological samples.

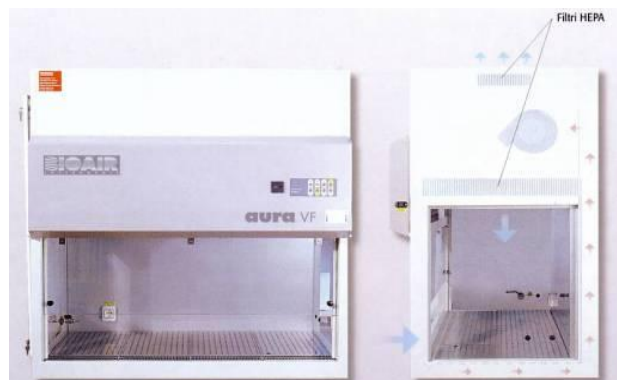


Shaker incubator – Grant, ES-20

Versatile programmable bench-top shaker-incubator for mixing and incubating biological fluids, samples, cell cultures and tissues.

Biological hood – Bioair, Aura 2000 MAC

Class II microbiological safety cabinet provided with HEPA filters. 70% of the HEPA-filtered air is reintroduced inside the hood, while the remaining 30 % is expelled through a dedicated HEPA filter. The system possesses an automatic airflow control.





Epifluorescence microscope - Nikon Instruments, Eclipse Ti-E

Inverted epifluorescence microscope. The system is provided with 4x to 60x objective lenses, fluorescence filters (FTIC, TRITC and DAPI), a lamp and a USB-PC user interface.

Optical microscope - Nikon Instruments, Eclipse TE2000

Inverted microscope compatible with all advanced live cell applications; this station is conceived to provide the highest level of optical imaging on live cells and on fixed cells labeled with fluorescent markers.



Standard



Comfort

Stove - Seneco Science, MMM

Heater for drying and sterilization applications up to 300 °C, with a fine temperature control. A natural convection system allows an efficient air exchange.

Polymer Lab



Infrared oven – Mechatronika, MR10

Fully programmable infrared oven, suitable for reflow soldering as well as glue heat drying.

**Laser cutter - Universal Laser Systems,
VersaLaser VLS2.30**

Laser cutting device. Laser cutting is a technology that uses a laser to cut materials, and it is typically used for industrial manufacturing applications. It can cut sheets having different thickness and made of different materials (e.g delrin, plexiglass, paper, etc.).



Sputter - Quorum Technologies , Q150R ES

Combined system with both sputtering and carbon coating. The deposition inserts can be swapped in few seconds and allows quick and reproducible sample metallization.



**Critical point dryer – Tousimis,
Autosamdri-931**

Critical point dryer. Critical point drying is an established method for dehydrating biological samples prior to examination under Scanning Electron Microscope.



**Benchtop freeze - Labconco , FreeZone Plus
2.5**

Benchtop freeze drying system. It is designed for light sample loads. Cascade refrigeration can handle samples with low eutectic points.

**Vacuum oven - Heraeus Instruments, VTR
5022**

Vacuum oven particularly suitable for degassing of foaming mixtures. Temperature and ventilation can be controlled in order to favor solvent evaporation or to trigger other temperature/pressure-based processes.



Artificial Hands Area

EMG EEG ECG amplifier- OT Bioelettronica system, EMG-USB2+



EMG-USB2+ is an amplifier for the acquisition of surface/intramuscular EMG signals, EEG and ECG signals. The system can record monopolar or bipolar channels from up to 256 detection sites.

3D scanner –Open Technologies, CRONOS 3D Dual

A preconfigured 3D optical scan capable of capturing any shape in the scan areas.

- Fast, detailed color 3D scan
- Intuitive, automated data management software
- Single capture relevant max detail and accuracy $\pm 20 \div 40 \mu\text{m}$.





Robotic arm –Universal Robots, U5

6 DoFs Industrial robot - UR5:

- Automate tasks up to 5 kgs (11 lbs)
- Reach radius of up to 850 mm
- Fast payback time

18-sensors data glove –CyberGlove System LCC, CyberGlove III Wifi 18 sensors

The 18-sensor data glove features two bend sensors on each finger, four abduction sensors, plus sensors measuring thumb crossover, palm arch, wrist flexion, and wrist abduction.



System for recording of physiological parameters –Affectiva, Q sensor

The Q Sensor is a wireless device that allows the wearer to record:

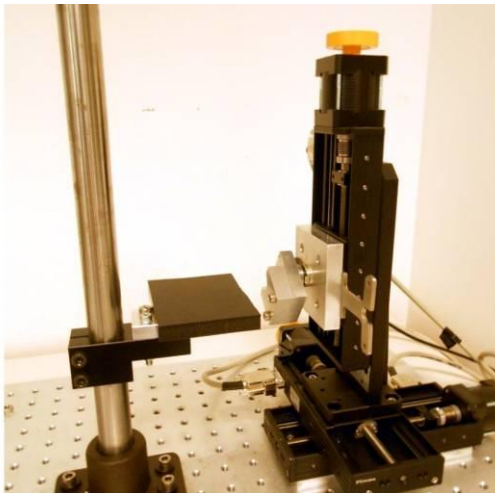
- skin conductance;
- temperature;
- acceleration.

**EEG cuff and amplifier–BIOSEMI, Active Two
16 channels**

EEG cuff recording system and amplifier, the system acquires up to 16 channels



**3D positioning system – PI miCos, VT-80 linear stage/
ATI Industrial Automation, Nano17 load cell**



System for characterization of sensors and materials mechanics, constituted by 3 linear stages. Each linear stage has:

- Travel range equal to 100 mm
- Unidirectional repeatability down to 0.4 mm
- Maximum speed 20 mm/s

The system includes also 6 axis (3 force and 3 torques components) transducer (diameter 17 mm, height 14.5 mm).

**Inertial Measurement Units – YEI 3 space
sensors, YEI technology**

The YEI 3-Space Sensor utilizes on-board processing and filtering algorithms to provide attitude and heading information based on the three-axis accelerometer, three-axis gyroscope, and three-axis compass



FUTURA & Wet Lab

Industrial manipulator – Mitsubishi, RV-6SL

Industrial manipulator with 6 DOFs, payload capability up to 6 kg, maximum composed speed approximately of 8500 mm/s. and maximum reach radius equal to 900 mm.



Industrial manipulator – Mitsubishi, RV-3SB

Industrial manipulator with 6 DOFs payload capability up to 3 kg, maximum composed speed approximately of 5500 mm/s and maximum reach radius equal to 642 mm.

Industrial manipulator – ABB, IRB120

Industrial manipulator suitable for high accuracy tasks, featured by 6 DOFs. The robot handles a payload of up to 3kg (4kg with its wrist down) and with a reach of 580 mm.





Sonogram – Esaote, MyLabFive

Mobile sonogram. The MyLabFive offers an extreme versatility by combining ergonomics, design and ease of use. Suitable for clinical environments, extremely flexible and modular architecture. The MyLab™Five machine is equipped with a Esaote CA430E Curved Array Ultrasound Probe (5-1.8 MHz) for vascular, abdominal, OB/GYN, and fetal echo applications.

Ultrasound system - BK Ultrasound, SonixTablet

SonixTablet is an ultrasound system offering excellent image quality on a 19" touch screen monitor. This device has two probes (4DC7-3/40 3D and PA7-4/12 Phased Array) in order to achieve 3D ultrasound images.

Sonix Tablet system is equipped with the Ultrasonix 4DC7-3/40 convex 3D Ultrasound probe. The Transducer/Probe frequency range is 7.0-3.0 Mhz/with frequency and it is applicable for abdominal, MSK, nerve block, small anatomical parts and vascular structures.



PA7-4/12 phased array 2D probe

2D phased array for abdominal and cardiac applications. Characteristic features:

- Bandwidth: 7-4MHz
- Depth range: 5-24cm
- Geometric focus: 35mm

Six axis F/T sensors

- Mini 45: http://www.atia.com/products/ft/ft_models.aspx?id=Mini45
- Nano 17: http://www.atia.com/products/ft/ft_models.aspx?id=Nano17



Nano 17



Mini 45



Oscilloscope – Agilent, MSO7034B

Oscilloscope featured by a bandwidth of 350 MHz, 4+16 channel MSO. It is used to record electrical signals over time with high accuracy and sensitivity.

MareLab - Senly Room (Florence)



5 cameras, Vicon 512 Motion Analysis System

Vicon 512 is the motion capture and analysis system designed and built for clinical and scientific uses. It is provided with:

- Vicon Datastation (the big white box).
- Vicon Workstation software installed on your PC.
- 5 cameras mounted on the wall (1 camera cannot be used due to a broken driver).
- Calibration equipment.
- Retro-reflective markers.

The device is installed “on the walls” at MareLab (Fondazione Don Gnocchi), in Florence.

6 cameras (mod. Bonita), Vicon Motion Analysis System

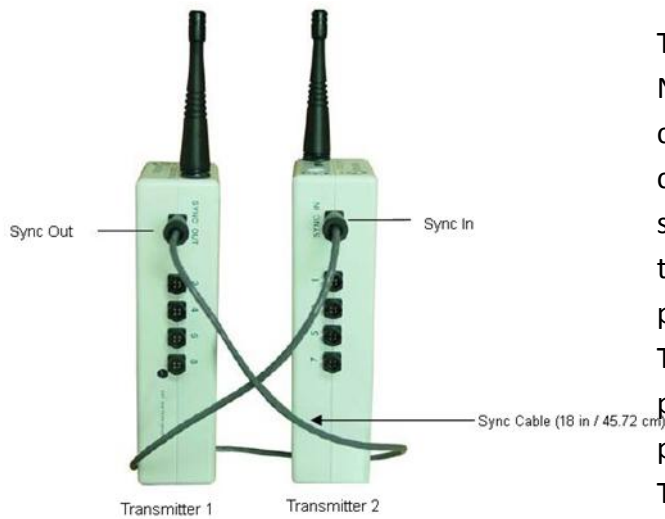
This Vicon Motion Analysis System is a new release of the system described above. Basically, it is provided with the same gears already reported above, even though all devices are more recently released by the company. In particular, it is provided with 6 Bonita cameras and related tripods.

It is worth noting that the two Vicon systems are not compatible, i.e., they can only work separately.

The device is currently at MareLab (Fondazione Don Gnocchi), in Florence, and can be moved according to the researchers' needs.



Noraxon Electromyography Equipment (Telemyo 2400T, V2, 16 channels)



The TeleMyo 2400T is an old generation of Noraxon telemetry products. Each transmitter can accommodate eight (8) channels of any combination of sEMG and a variety of analog signals. Our version is provided with two (2) transmitters which can be coupled together to provide up to 16 channels.

The active electrode leads use Noraxon's patented signal processing technology to provide clear, consistent, and reliable data. The TeleMyo 2400T System operates as an IEEE 802.11b wireless local area network. Communication is bidirectional, using an internationally accepted direct sequence spread spectrum 2.4GHz radio channel. The 2400T transmitter/PC Card combination allows the user to collect data using only two small components and a computer. Once acquired, all data remains in a digital format. An optional receiver unit, the TeleMyo 2400R, is available for users who require data in an analog format.

Research Centre on Sea Technologies and Marine Robotics (Scoglio della Regina - Livorno)

Laser cutter - Universal Laser Systems, VersaLaser VLS3.60

Laser cutting device. Laser cutting is a technology that uses a laser to cut materials, and it is typically used for industrial manufacturing applications. It can cut sheets having different thickness and made of different materials (e.g delrin, plexiglass, paper, etc.).



3D Printer – Stratasis, Dimension SST 1200 es

3D printer. It is suitable to print durable, precision ABS parts ideal for rapid prototyping and functional testing. Accuracy: 254/330 μm , build volume: 254 × 254 × 305 mm.

Rehabilitation Bioengineering Laboratory (Volterra)



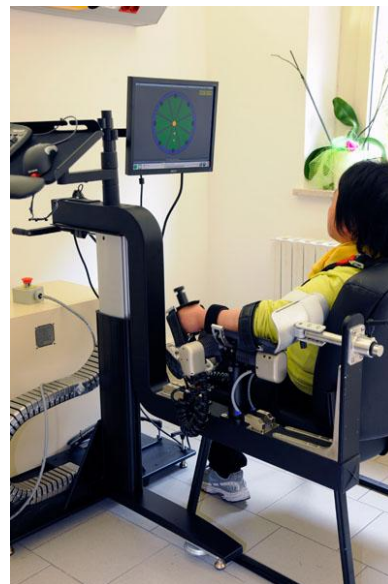
InMotion ARM, Interactive Motion Technologies

2 DOFs robotic system for shoulder-elbow rehabilitation of stroke patients.

InMotion WRIST, Interactive Motion Technologies

3 DOFs robotic system for wrist rehabilitation of stroke patients:

- flexion/extension;
- abduction/adduction;
- pronation/supination.



Wii videogame console and Wii Balance Board

Integrated system for postural and balance hospital and home-based neurological and cardio-respiratory rehabilitation.



Wireless system for surface electromyography

- Receiving unit Wi-Fi BTS FREEMG300
- 16 wireless EMG probes
- PDA HP iPAQ hx4700 Pocket PC
- 4 multipurpose wireless probes
- Footswitch kit
- Hip/Knee electrogoniometer
- Ankle electrogoniometer