life.augmented

ROBOTS for a better living

About Robotics...

Robots are a complex synthesis of mechanical and electronic design. Robots were first used to drive factory automation in the industrial revolution of the twentieth century, and today have evolved to the point where we are seeing service robots in both industrial and in domestic environments.
The design of a robotics system can be classified according to certain features in their construction:

- Their mechanical build in order to perform certain tasks.
- The level of electronic enhancement in the form of sensing or awareness of heat, sound, position and other ambient conditions, data processing speed and power, and the level of sophistication or intelligence of algorithms applied by robots to trigger actions and decisions. High precision movement, for instance, is driven by highly complex motor control algorithms, while the sensing instruments are supported by intelligent agents.

The combination of the mechanical and electronic characteristics form the essence of a robot, because an excellent mechanical design will not perform adequately without a high level of electronic integration, and vice versa. A robot drone, for example, of course needs propellers to fly, but it will have no stability or control without electronic speed controllers to drive the motors, just as robots designed to interact with humans require fine force and movement control to avoid injury to people around them.

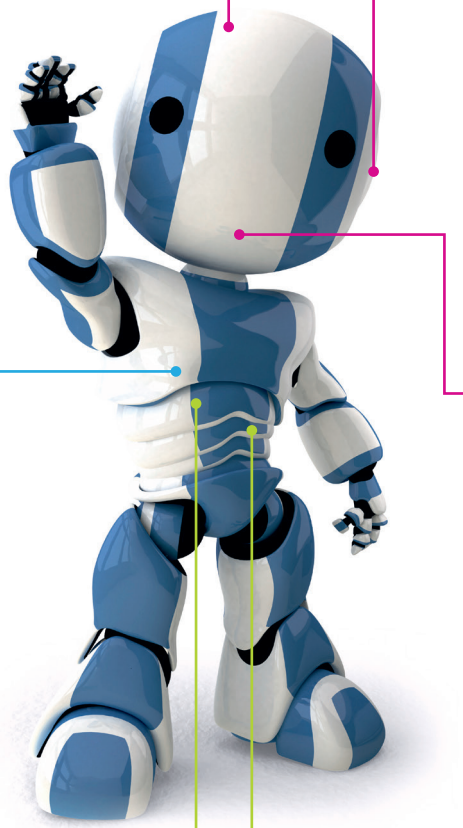
Interact with the World

CONNECTIVITY

- Manage the Robot from your Smartphone
- Control the Robot using voice command via your headset
- Robot thinks and breathes in the cloud
- Implement cooperative robotics through WAN and IoT

MICROPHONE

- Localize sounds using binatural, high-quality, digital MEMS microphones
- Isolate Human Voice from ambient noise
- Improve sound processing using noise cancelling and beam forming techniques



INERTIAL MODULES

- Detect pelvis, torso and head angles
- Manage movements using an inertial navigation system

SOUND TERMINAL

- Output audio on 15/20 W stereo Broadcast System
- Integrate Digital Audio Processing and Digital Amplifier Control

BATTERY MANAGEMENT

- Supervise battery status in real time
- Charge Wirelessly using inductive technology
- Harvest Energy

PROCESSING

- Extract information from images
- Recognize faces to interact with Humans
- Reconstruction of scenes for 3D modeling
- Enable Artificial Intelligence algorithms
- Express Emotions

A COLLECTION OF ST PRODUCTS AND DESIGN TOOLS CAN BE FOUND AT:

Wander the World

ENVIRONMENTAL SENSORS

- Collect accurate humidity, atmospheric pressure and temperature data for environmental awareness
- Monitor air quality

CAMERA

- See everything from as close to as far as you want
- Stereo Video Pipe for 3D vision
- Multi-zone Auto-Focus

MOTOR DRIVE

- Move symmetrical motors using a single command
- Enhance robot movement by improving motor performance

POWER TRANSISTORS

- Ideal fast switching to boost efficiency
- Higher system efficiency & reduced cooling system dimensions

PROXIMITY SENSORS

- Determine ambient light Levels
- Camera Autofocus and Video Assist
- Obstacle Avoidance for simultaneous localization and mapping

LED DRIVING

- Illuminate dark paths
- Easily Visible Signals indicating status and functionality

A COLLECTION OF ST PRODUCTS AND DESIGN TOOLS CAN BE FOUND AT:

Admire the World

STM32 F4
STM32 F7
STM32 H7

PROCESSING

- High performance MCUs enable Autopilot system capabilities
- Manage coordinates and plan a route
- Monitor and Drive the Electronic Speed Controllers

Teseo

GPS/GNSS

- Perform Geo-Tagging
- Localize Robot's position
- Self-navigating

STSPIN

MOTOR DRIVE

- Enhance robot movement with improved motor performance
- Move symmetrical motors with a single command

STM32 F0
STM32 F3

PROCESSING

- Manage Motor Control Algorithms for each rotor
- Optimize efficiency, increase battery life and flight time

iNEMO

INERTIAL MODULES

- High precision accelerometer and gyroscopes necessary for stable flight
- Inertial Measurement Units for Gimbal frame orientation

PRESSURE SENSORS

- Measure the elevation gain and vertical speed
- Waterproof sensor resistant to chemicals like chlorine, bromine, salt water as well as soap and detergents

A COLLECTION OF ST PRODUCTS AND DESIGN TOOLS CAN BE FOUND AT:

ST in Robotics

ST offers products across the entire Bill of Materials (BOM) for robotics applications: STM32 microcontrollers, iNEMOTM inertial modules, STSPIN motor drivers, transceivers and network processors ICs, Teseo positioning chips and many others devices, including precision amplifiers, power transistors and battery management systems.
Our design tools and development boards help designers optimize their solutions, and our online community is a rich resource for tens of thousands of users and contributors across professional and academic circles.

ST has a long-standing cooperation with leaders in the field of robotics. If you are planning to build a humanoid robot, then ST offers a lot of what you will need. Whether it is sensors, motor drives, processors, connectivity or power management devices, ST has a solution. Moreover, ST offers a comprehensive development ecosystem to support developers and hobbyists and help them get started…..

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Istituto Italiano di Tecnologia (IIT), an international scientific and technological research center based in Italy, has selected ST as a technological partner for one of the latest versions of its iCub robot. In fact, the most recent version of the iCub robot includes more than twenty STM32 microcontrollers combined with STSPIN motor drivers, while ST MEMS accelerometers and gyroscopes are used for orientation.