The main theme of this chapter is about different methods of tactile recognition of the environment and interaction forces with the environment with sensors as well as the processing of the information provide by them.

Despite the progress made in the last years, the field of tactile sensing has not been developed like other systems of sensing due to great amount sensors necessary to obtain satisfactory results, wiring complexity, requirements of the skin or surface in which sensors are embedded and resistance and toughness of the sensors to endure physical contact.

The sense of touch allows living organisms to perceive qualities of objects and media such as pressure, temperature, texture and hardness. Just like in humans, the autor shows three differents purposes of touch detection which are manipulation, exploration and response.

With regard to sensor types, the chapter refers to sensors which need physical contact with the environ or mechanical stimulation to obtain information about shape and force. Also, it is reviewed how obtain the same information from sensors with differents operating modes.

The first type of sensor mentioned, known as propioceptive, provides information about awareness of the position and movement of articulated limbs as well as forces to which they are subjected.The next section deals about temperature and composition material sensors. Information about members position is provided by kinematic sensors. Sensors discussed below provides information about applied loads and forces. Surface recognition and accurate and precise manipulation are tasks developed by dynamic tactile sensors. Finally, array sensors are discussed, focussing on contact location sensor, pressure and skin deflection sensing.

In the next part of the chapter different ways of treatment of the information obtained from the sensors are ranked taking into account the three categories that were previously describe. In addition, to perform tasks it is usually necessary to take into account more than one feature at a time.

The section begins with the processing of data from the sensors to know the relative position of the hand or grip that contains the sensor with the environment.

The second aspect treated of the information treatment focuses on the mathematical calculation of the data obtained by deformation under pressure of contact surface in deformable solids.

The following section indicates an alternative to obtain the deformation of the contact surface of the skin as well as the shape and position of the elements to identify by mesuring the flex created by skin contact.

On the other hand the combination of force sensors and tactile array allows the identification and organization of elements among a set of them. Methods for examining element boundary are discussed below.

Finishing this section, the last topic covered are about the most suitable sensors for tasks requiring smooth contact and incorporation of other type of sensors.

Finally, the difficulties of incorporating the sensors are analyzed, as already introduced at the beginning, the choice of the most suitable sensor for each type of task and the evolution of the area of touch sensors to add more functionalities.