**From embodying tool to embodying alien limb: sensorymotor modulation of personal and extrapersonal space**

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Years ago, it was demonstrated (e.g. Rizzolatti et al., 2000) that the brain does not encode the space around us in a homogeneous way, but through neural circuits that map the space relative to the distance that objects of interest have from the body. In monkeys, relatively discrete neural systems, characterised by neurons with specific neurophysiological responses, seem to be dedicated either to represent the space that can be reached by the hand (near/peripersonal space) or to the distant space (far/extrapersonal space). It was also shown that the encoding of spaces has dynamic aspects because they can be remapped by the use of tools that trigger different actions (e.g. Iriki et al, 1998). In this latter case the effect of the tool depends on the modulation of personal space, that is the space of our body. In my talk I will review and discuss selected research, which demonstrated that also in humans; 1 spaces are encoded in a dynamic way; 2 encoding can be modulated by the use of tool that the system comes to consider as parts of the own body; 3 body representations are not fixed, but they are fragile and subject to change to the point that we can incorporate not only the tools necessary for action, but even limbs belonging to others people.