Tactile commanding of redundant mobile manipulators using a single force/torque sensor

Robotic assistants for manufacturing environments need several ways of interaction in order to manoeuvre through unknown and unstructured settings. Focus of this talk is on the tactile interaction between man and robot which is used for direct cooperation in tasks jointly performed by worker and robot. A control scheme will be described which combines a mobile platform with a robot arm. Based on separate controllers for both subsystems a method for force guidance will be proposed which provides control of the tool location and of the posture of the mobile manipulator. Only a single force/torque sensor is used for this purpose. Preferred configurations of the arm where the highest manipulability is provided are used for the underlying coordination. Furthermore the operator should be able to command the robot directly, similar to symbolic interaction via teach box or visual gestures. It will be explained how such gestures of physical contact can be defined and recognised.