

ROBOT WITH CONTROL SYSTEM FOR DISCRETE MANUAL INPUT OF POSITIONS AND/OR POSES

ABSTRACT

5 The invention relates to a robot, a robot control system, and a method for controlling a robot. The robot comprises a movable, multi-membered robot structure (102) that can be driven by means of actuators (101), at least one marked structural element S being defined on the movable robot structure (102), with at least one point P_S marked on the structural element S. The robot is designed such that, in an input

10 mode, it learns positions POS_{PS} of the point P_S and/or poses of the structural element S in a work space of the robot, the user exerting an input force F_{EING} on the movable robot structure in order to move the structural element S, which is conveyed to the point P_S as $F_{EING,PS}$, and/or to the structural element S as torque $M_{EING,S}$. A control device (103) of the robot is designed such that, in the input mode, the

15 actuators (101) are controlled on the basis of a pre-defined space-fixed virtual 3D grid that at least partially fills the work space, such that the structural element S is moved with a pre-defined force $F_{GRID}(POS_{PS})$, according to the current position POS_{PS} of the point P_S in the 3D grid, to the adjacent grid point of the 3D grid or in a grid point space defined around the adjacent grid point of the 3D grid, the point P_S of

20 the structural element S remaining on said adjacent grid point or in said grid point space in the event of the following holding true: $|F_{EING,PS}| < |F_{GRID}(POS_{PS})|$ and/or, in the input mode, the actuators (101) are controlled on the basis of a pre-defined virtual discrete 3D orientation space O, where the 3D orientation space $O =: (\alpha_i, \beta_j, \gamma_k)$ where $i = 1, 2, \dots, I, j = 1, 2, \dots, J, k = 1, 2, \dots, K$ is defined or can be defined by a

25 pre-defined angle $\alpha_i, \beta_j, \gamma_k$, in such a way that the structural element S is moved with a pre-defined torque M_O according to the current orientation OR_S of the structural element, towards the adjacent discrete orientation of the 3D orientation space $O =: (\alpha_i, \beta_j, \gamma_k)$, S, the structural element remaining in said adjacent discrete orientation of the 3D orientation space O in the event that the following holds true:

30 $|M_{EING,S}| < |M_O(OR_S)|$.