Claims

1. A simulation method for specifying a relative position between a first base (11) of a first robot manipulator (10) and a second base (21) of a second robot manipulator (20),

   wherein a first working area of the first robot manipulator (10) is determined (H1),
   wherein the first working area determines a finite plurality of tuples from possible positions of a first end effector (12) of the first robot manipulator (10) and possible orientations of the first end effector (12) at the respective positions of the first end effector (12),
   wherein, for each of a specified plurality of possible relative positions between the first base (11) and the second base (21), a number of those tuples from the first working area are determined (H2) as evaluation variables for which a second end effector (22) of the second robot manipulator (20) can be positioned in a predefined orientation and/or at a predefined distance relative to the first end effector (12), and
   wherein the relative position between the first base (11) and the second base (21) with the highest evaluation variable is determined and output (H3).

2. The simulation method according to claim 1,

   wherein the simulation method is used for specifying a relative position and a relative orientation between the first base (11) of the first robot manipulator (10) and the second base (21) of the second robot manipulator (20),
   wherein the evaluation variable is determined for each of a specified plurality of possible relative positions and possible relative orientations between the first base (11) and the second base (21),
   wherein the relative position and relative orientation between the first base (11) and the second base (21) with the highest evaluation variable is determined and output.

3. The simulation method according to any one of the preceding claims,

   wherein, in determining the evaluation variable, a check is made to determine whether a collision occurs between the first robot manipulator (10) and the second robot manipulator (20).

4. The simulation method according to any one of claims 1 to 3,

wherein the possible relative orientations and/or the possible relative positions between the first base (11) and the second base (21) are predetermined from the specified plurality in a grid.

5. The simulation method according to any one of claims 1 to 3,
wherein the possible relative orientations and/or the possible relative positions between the first base (11) and the second base (21) from the given plurality are specified by constrained nonlinear optimization.

6. The simulation method according to claim 5,
wherein a second working area of the second robot manipulator (20) is determined,
wherein the second working area determines a finite plurality of tuples from possible positions of the second end effector (22) and possible orientations of the second end effector (22) at the respective positions of the second end effector (22), and
wherein a constraint of the nonlinear optimization is determined based on an intersection of the first working area of the first robot manipulator (10) and the second working area of the second robot manipulator (20).

7. The simulation method according to any one of the preceding claims,
wherein the predefined orientation of the second end effector (22) relative to the first end effector (12) is defined by a half rotation about a reference point of the first end effector (12), such that the first end effector (12) and the second end effector (22) point symmetrically to each other.

8. A simulation computing unit (30) for specifying a relative position between a first base (11) of a first robot manipulator (10) and a second base (21) of a second robot manipulator (20), wherein the simulation computing unit (30) is arranged and executed to determine a first working area of the first robot manipulator (10), wherein the first working area specifies a finite plurality of tuples of possible positions of a first end effector (12) of the first robot manipulator (10) and possible orientations of the first end effector (12) at the respective positions of the first end effector (12), wherein the simulation computing unit (30) is further arranged and executed to determine for each of a specified plurality of possible relative positions

between the first base (11) and the second base (21), a number of those tuples from the first working area as an evaluation variable for which a second end effector (22) of the second robot manipulator (20) can be positioned in a predefined orientation and/or at a predefined distance, in each case relative to the first end effector (12), and wherein the simulation computing unit (30) is arranged and executed to determine and output that relative position between the first base (11) and the second base (21) with the highest evaluation variable.

9. The simulation computing unit (30) according to claim 8,
wherein the simulation computing unit (30) is used for specifying a relative position and a relative orientation between the first base (11) of the first robot manipulator (10) and the second base (21) of the second robot manipulator (20), wherein the simulation computing unit (30) is further arranged and executed to determine the evaluation variable for each of a specified plurality of possible relative positions and possible relative orientations between the first base (11) and the second base (21), , and to determine and output that relative position and relative orientation between the first base (11) and the second base (21) having the highest evaluation variable.

10. The simulation computing unit (30) according to any one of claims 8 to 9,
wherein the simulation computing unit (30) is a control unit of the first robot manipulator (10).