CLAIMS

1. A method of operation of a robot, wherein the robot includes at least one processor and a non-transitory processor-readable storage medium communicatively coupled to the at least one processor, the non-transitory processor-readable storage medium storing a library of reusable work primitives and processor-executable instructions that, when executed by the at least one processor, cause the robot to autonomously perform the reusable work primitives in the library of reusable work primitives, the method comprising:
initiating a first work objective;
initiating a first workflow to complete the first work objective, the first workflow comprising a first set of reusable work primitives selected from the library of reusable work primitives; and
executing the first workflow, wherein executing the first workflow includes executing the first set of reusable work primitives.

2. The method of claim 1 , further comprising:
initiating a second work objective that is different from the first work objective; initiating a second workflow to complete the second work objective, the second workflow comprising a second set of reusable work primitives selected from the library of reusable work primitives, wherein the second workflow is different from the first workflow and at least one common reusable work primitive is included in both the first workflow and the second workflow; and
executing the second workflow, wherein executing the second workflow includes executing the second set of reusable work primitives.

3. The method of claim 2, further comprising:
initiating at least one additional work objective that is different from both the first work objective and the second work objective;
initiating at least one additional workflow to complete the at least one additional work objective, the at least one additional workflow comprising at least one additional set of reusable work primitives selected from the library of reusable work primitives, wherein the at least one additional workflow is different from both the first workflow and the second workflow, and wherein at least one common reusable work primitive is included in all of the first workflow, the second workflow, and the at least one additional workflow; and
executing the at least one additional workflow, wherein executing the at least one additional workflow includes executing the at least one additional set of reusable work primitives.

4. The method of claim 1 wherein the robot includes a telecommunication interface communicatively coupled to the at least one processor, and wherein initiating a first work objective includes receiving instructions related to the first work objective via the telecommunications interface.

5. The method of claim 1 wherein initiating a first work objective includes autonomously identifying, by the robot, the first work objective.

6. The method of claim 1 wherein the robot includes a telecommunication interface communicatively coupled to the at least one processor, and wherein initiating a first workflow to complete the first work objective includes receiving the first workflow via the telecommunications interface.

7. The method of claim 1 wherein initiating a first workflow to complete the first work objective includes autonomously identifying the first set of reusable work primitives by the robot.

8. The method of claim 1 wherein the robot includes at least a first physically actuatable component communicatively coupled to the at least one processor and the library of reusable work primitives includes a set of reusable work primitives performable by the first physically actuatable component, and wherein;
initiating a first workflow to complete the first work objective includes initiating a first set of reusable work primitives that includes at least one reusable work primitive from the set of reusable work primitives performable by the first physically actuatable component; and executing the first workflow includes executing, by the first physically actuatable component, the at least one reusable work primitive from the set of reusable work primitives performable by the first physically actuatable component.

9. The method of claim 8 wherein the first physically actuatable component is operative to grasp objects and the set of reusable work primitives performable by the first physically actuatable component includes a set of reusable grasp primitives performable by the first physically actuatable component, and wherein:
initiating a first set of reusable work primitives that includes at least one reusable work primitive from the set of reusable work primitives performable by the first physically actuatable component includes initiating a first set of reusable work primitives that includes at least one reusable grasp primitive; and
executing, by the first physically actuatable component, the at least one reusable work primitive from the set of reusable work primitives performable by the first physically actuatable component includes executing, by the first physically actuatable component, the at least one reusable grasp primitive.

10. The method of claim 1 wherein initiating a first workflow to complete the first work objective includes initiating a first permutation of a first combination of reusable work primitives from the library of reusable work primitives.

11. The method of claim 1 wherein executing the first set of reusable work primitives includes executing, by the at least one processor, the processor-executable instructions stored in the non-transitory processor-readable storage medium to cause the robot to autonomously perform the first set of reusable work primitives.

12. A robot comprising:
a body;

at least one physically actuatable component mechanically coupled to the body; at least one processor communicatively coupled to the at least one physically actuatable component; and
at least one non-transitory processor-readable storage medium communicatively coupled to the at least one processor, the at least one non-transitory processor-readable storage medium storing a library of reusable work primitives and processor-executable instructions that, when executed by at least one processor, cause the robot to:
initiate a first work objective;
initiate a first workflow to complete the first work objective, the first workflow comprising a first set of reusable work primitives selected from the library of reusable work primitives; and
execute the first workflow, wherein executing the first workflow includes executing the first set of reusable work primitives.

13. The robot of claim 12 wherein the processor-executable instructions, when executed by the at least one processor, further cause the robot to:
initiate a second work objective that is different from the first work objective; initiate a second workflow to complete the second work objective, the second workflow comprising a second set of reusable work primitives selected from the library of reusable work primitives, wherein the second workflow is different from the first workflow and at least one common reusable work primitive is included in both the first workflow and the second workflow; and
execute the second workflow, wherein executing the second workflow includes executing the second set of reusable work primitives.

14. The robot of claim 12, further comprising a telecommunication interface communicatively coupled to the at least one processor to receive at least one set of instructions from a group consisting of: instructions related to the first work objective and instructions related to the first workflow.

15. The robot of claim 12 wherein the non-transitory processor-readable storage medium further stores processor-executable instructions that, when executed by the at least one processor, cause the robot to autonomously identify the first workflow to complete the first work objective.

16. The robot of claim 12 wherein the library of reusable work primitives includes a set of reusable work primitives performable by the at least one physically actuatable component, and wherein the processor-executable instructions that, when executed by the at least one processor, cause the robot to execute the first set of reusable work primitives, cause the at least one physically actuatable component to perform at least one reusable work primitive.

17. The robot of claim 16 wherein the at least one physically actuatable component includes an end effector that is operative to grasp objects and the set of reusable work primitives performable by the at least one physically actuatable component includes a set of reusable grasp primitives performable by the end effector, and wherein the processor-executable instructions that, when executed by the at least one processor,

~~cause the at least one physically actuatable component to perform at least one reusable work primitive, cause the end effector to perform at least one grasp primitive.~~

~~18. A computer program product comprising:~~
~~a library of reusable work primitives; and~~
~~processor-executable instructions and/or data that, when the computer program product is stored in a non-transitory processor-readable storage medium of a robot system and executed by at least one processor of the robot system, the at least one processor communicatively coupled to the non-transitory processor-readable storage medium, cause the robot system to:~~
~~initiate a first work objective;~~
~~initiate a first workflow to complete the first work objective, the first workflow comprising a first set of reusable work primitives selected from the library of reusable work primitives; and~~
~~execute the first workflow, wherein executing the first workflow includes executing the first set of reusable work primitives.~~

~~19. The computer program product of claim 18, further comprising: processor-executable instructions and/or data that, when the computer program product is stored in the non-transitory processor-readable storage medium of the robot system and executed by at least one processor of the robot system, cause the robot system to: initiate a second work objective that is different from the first work objective; initiate a second workflow to complete the second work objective, the second workflow comprising a second set of reusable work primitives selected from the library of reusable work primitives, wherein the second workflow is different from the first workflow and at least one common reusable work primitive is included in both the first workflow and the second workflow; and~~
~~execute the second workflow, wherein executing the second workflow includes executing the second set of reusable work primitives.~~

~~20. The computer program product of claim 18, further comprising:~~
~~processor-executable instructions and/or data that, when the computer program product is stored in the non-transitory processor-readable storage medium of the robot system and executed by at least one processor of the robot system, cause the robot system to autonomously identify the first workflow to complete the first work objective.~~

~~21.~~ 1. A method of operation of a robot to grasp an object, wherein the robot includes:

a robotic hand having multiple fingers and an opposable thumb;

at least one processor operative to control actuations of the robotic hand;

at least one sensor communicatively coupled to the at least one processor; and

a non-transitory processor-readable storage medium communicatively coupled to the at least one processor, the non-transitory processor-readable storage medium storing a library of reusable grasp primitives and processor-executable instructions that,

when executed by the at least one processor, cause the robotic hand to autonomously perform the reusable grasp primitives in the library of reusable grasp primitives, the method comprising:

collecting data about the object by the at least one sensor;

analyzing the data by the at least one processor to determine a geometry of the object;

selecting, by the at least one processor, a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object; and

executing, by the robotic hand, the particular reusable grasp primitive to grasp the object.

~~22.~~ 2. The method of claim ~~21~~1 wherein executing, by the robotic hand, the particular reusable grasp primitive to grasp the object includes executing, by the at least one processor, processor-executable instructions that cause the robotic hand to autonomously perform the particular reusable grasp primitive to grasp the object.

~~23.~~ 3. The method of claim ~~21~~1 wherein the at least one sensor includes at least one optical sensor, and wherein:

collecting data about the object by the at least one sensor includes collecting optical data about the object by the at least one optical sensor; and

analyzing the data by the at least one processor to determine a geometry of the object includes analyzing the optical data by the at least one processor to determine the geometry of the object.

~~24.~~ 4. The method of claim ~~21~~1 wherein selecting, by the at least one processor, a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object includes selecting, by the at least one processor, the particular reusable grasp primitive that best fits the geometry of the object relative to all other reusable grasp primitives in the library of reusable grasp primitives.

~~25.~~ 5. The method of claim ~~24~~4 wherein selecting, by the at least one processor, the particular reusable grasp primitive that best fits the geometry of the object includes selecting, by the at least one processor, the particular reusable grasp primitive that employs a configuration of the multiple fingers and the opposable thumb of the robotic hand that best accommodates the geometry of the object relative to all other reusable grasp primitives in the library of reusable grasp primitives.

~~26.~~ 6. The method of claim ~~21~~1 wherein selecting, by the at least one processor, the particular reusable grasp primitive that best fits the geometry of the object includes simulating, by the at least one processor, the robotic hand grasping the object with each reusable grasp primitive in the library of reusable grasp primitives to determine which particular reusable grasp primitive in the library of reusable grasp primitives best fits the geometry of the object relative to all other grasp primitives in the library of reusable grasp primitives.

~~27.~~ 7. The method of claim ~~21~~1, further comprising:

analyzing additional data about the object by the at least one processor to determine at least one additional parameter of the object, wherein selecting, by the at least one processor, a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object includes selecting, by the at least one processor, the particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on both the geometry of the object and the at least one additional parameter of the object.

~~28.~~ 8. The method of claim ~~27~~7, further comprising:

collecting the additional data about the object by the at least one sensor, and wherein the additional data about the object is selected from a group consisting of: a hardness of the object, a rigidity of the object, an identity of the object, a function of the object, and a mass of the object.

~~29.~~ 9. The method of claim ~~27~~7 wherein the robot further includes at least one receiver communicatively coupled to the at least one processor, and wherein the method further comprises:

receiving the additional data about the object by the receiver.

~~30.~~ 10. The method of claim ~~21~~1 wherein the non-transitory processor-readable storage medium further stores data about a work objective to be performed by the robot, the work objective involving grasping the object, and wherein selecting, by the at least one processor, a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object includes selecting, by the at least one processor, the particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on both the geometry of the object and the data about the work objective to be performed by the robot.

~~31.~~ 11. A robot comprising:

a body;

a robotic hand mechanically coupled to the body, the robotic hand having multiple fingers and an opposable thumb;

at least one processor operative to control actuations of the robotic hand;

at least one sensor communicatively coupled to the at least one processor; and

a non-transitory processor-readable storage medium communicatively coupled to the at least one processor, the non-transitory processor-readable storage medium storing a library of reusable grasp primitives and processor-executable instructions that, when executed by the at least one processor, cause the robot to:

collect data about the object;

analyze the data to determine a geometry of the object;

select a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object; and

execute the particular reusable grasp primitive to grasp the object.

~~32.~~ 12. The robot of claim ~~31~~11 wherein the processor-executable instructions that, when executed by the at least one processor, cause the robot to execute the particular reusable grasp primitive to grasp the object, cause the robotic hand to autonomously perform the particular reusable grasp primitive to grasp the object.

~~33.~~ 13. The robot of claim ~~31~~11 wherein the at least one sensor includes at least one optical sensor, and wherein the processor-executable instructions that, when executed by the at least one processor, cause the robot to collect data about the object, cause the at least one optical sensor to collect optical data about the object.

~~34.~~ 14. The robot of claim ~~31~~11 wherein the processor-executable instructions that, when executed by the at least one processor, cause the robot to select a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object, cause the robot to select the particular reusable grasp primitive that best fits the geometry of the object relative to all other reusable grasp primitives in the library of reusable grasp primitives.

~~35.~~ 15. The robot of claim ~~34~~14 wherein the processor-executable instructions that, when executed by the at least one processor, cause the robot to select the particular reusable grasp primitive that best fits the geometry of the object, cause the robot to select the particular reusable grasp primitive that employs a configuration of the multiple fingers and the opposable thumb of the robotic hand that best accommodates the geometry of the object relative to all other reusable grasp primitives in the library of reusable grasp primitives.

~~36.~~ 16. The robot of claim ~~31~~11 wherein the processor-executable instructions that, when executed by the at least one processor, cause the robot to select a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object, cause the robot to simulate the robotic hand grasping the object with each reusable grasp primitive in the library of reusable grasp primitives to determine which particular reusable grasp primitive in the library of

reusable grasp primitives best fits the geometry of the object relative to all other grasp primitives in the library of reusable grasp primitives.

~~37.~~ 17. The robot of claim ~~31~~11 wherein the non-transitory processor-readable storage medium further stores processor-executable instructions that, when executed by the at least one processor, cause the robot to analyze additional data about the object to determine at least one additional parameter of the object, and wherein the processor-executable instructions that, when executed by the at least one processor, cause the robot to select a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object, cause the robot to select a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on both the geometry of the object and the at least one additional parameter of the object.

~~38.~~ 18. The robot of claim ~~37~~17 wherein the non-transitory processor-readable storage medium further stores processor-executable instructions that, when executed by the at least one processor, cause the robot to collect the additional data about the object, and wherein the additional data about the object is selected from a group consisting of: a hardness of the object, a rigidity of the object, an identity of the object, a function of the object, and a mass of the object.

~~39.~~ 19. The robot of claim ~~37~~17, further comprising:

at least one receiver communicatively coupled to the at least one processor, and wherein the non-transitory processor-readable storage medium further stores processor-executable instructions that, when executed by the at least one processor, cause the robot to receive the additional data about the object.

~~40.~~ 20. The robot of claim ~~31~~11 wherein the non-transitory processor-readable storage medium further stores data about a work objective to be performed by the robot, the work objective involving grasping the object, and wherein the processor-executable instructions that, when executed by the at least one processor, cause the robot to select

a particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on the geometry of the object, cause the robot to select the particular reusable grasp primitive from the library of reusable grasp primitives based, at least in part, on both the geometry of the object and the data about the work objective to be performed by the robot.

~~41.~~ 21. A computer-implemented method of initializing a robot to complete a multitude of work objectives, the method comprising:

defining a library of reusable work primitives each performable by the robot, wherein respective combinations and permutations of reusable work primitives from the library of reusable work primitives are initiated and executed by the robot in order to complete respective work objectives; ~~and~~

training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives~~.~~, wherein the training the robot comprises:

~~42. The method of claim 41 wherein training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives includes training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives in a simulated environment.~~

~~43. The method of claim 42 wherein training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives in a simulated environment includes:~~

generating a ~~first~~ simulated instance of the robot in ~~the simulated environment;~~

~~repeatedly executing processor-executable instructions to cause the first simulated instance of the robot to perform a first reusable work primitive in the library of reusable work primitives; and~~a simulated environment;

~~refining the processor-executable instructions that cause the first simulated instance of the robot to perform the first reusable work primitive based on at least one result of repeatedly executing the processor-executable instructions to cause the first simulated instance of the robot to perform the first reusable work primitive.~~

~~44. The method of claim 43 wherein training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives in a simulated environment further includes:~~

~~generating at least one additional simulated instance of the robot in the simulated environment;~~

~~repeatedly executing processor-executable instructions to cause the at least one additional simulated instance of the robot to perform the first reusable work primitive in the library of reusable work primitives; and~~

~~refining the processor-executable instructions that cause both the first simulated instance of the robot and the at least one additional simulated instance of the robot to perform the first reusable work primitive based on at least one result of repeatedly executing the processor-executable instructions to cause the first simulated instance of the robot and the at least one additional simulated instance of the robot to perform the first reusable work primitive.~~

~~45. The method of claim 43 wherein training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives in a simulated environment further includes:~~

~~repeatedly executing processor-executable instructions to cause the first simulated instance of the robot to perform at least one additional reusable work primitive in the library of reusable work primitives; and~~

~~refining the processor-executable instructions that cause the first simulated instance of the robot to perform the at least one additional reusable work primitive based on at least one result of repeatedly executing the processor-executable instructions to cause the first simulated instance of the robot to perform the at least one additional reusable work primitive.~~

~~46. The method of claim 41 wherein training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives includes:~~

receiving teleoperation instructions that cause the robot to perform a first reusable work primitive in the library of reusable work primitives <u>including receiving teleoperation instructions that cause the simulated instance of the robot to perform the first reusable work primitive in the simulated environment</u>;

executing the teleoperation instructions to cause the robot to perform the first reusable work primitive in the library of reusable work primitives <u>including executing the teleoperation instructions to cause the simulated instance of the robot to perform the first reusable work primitive in the simulated environment</u>; and

generating processor-executable instructions that cause the robot to replay the teleoperation instructions that cause the robot to perform the first reusable work primitive in the library of reusable work primitives <u>including generating processor-executable instructions that cause the simulated instance of the robot to replay the teleoperation instructions that cause the simulated instance of the robot to perform the first reusable work primitive in the simulated environment</u>.

~~47.~~ 22. The method of claim ~~46~~21 wherein receiving teleoperation instructions that cause the robot to perform a first reusable work primitive in the library of reusable work primitives includes receiving low-level teleoperation instructions that cause the robot to emulate real physical actions performed by a real teleoperation pilot.

~~48.~~ 23. The method of claim ~~46~~21 wherein receiving teleoperation instructions that cause the robot to perform a first reusable work primitive in the library of reusable work primitives includes receiving high-level teleoperation instructions that cause the robot to perform actions selected from a graphical user interface.

~~49. The method of claim 46 wherein training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives further includes generating a simulated instance of the robot in a simulated environment, and wherein:~~
~~receiving teleoperation instructions that cause the robot to perform a first reusable work primitive in the library of reusable work primitives includes receiving teleoperation instructions that cause the simulated instance of the robot to perform the first reusable work primitive in the simulated environment;~~
~~executing the teleoperation instructions to cause the robot to perform the first reusable work primitive in the library of reusable work primitives includes executing the teleoperation instructions to cause the simulated instance of the robot to perform the first reusable work primitive in the simulated environment; and~~
~~generating processor-executable instructions that cause the robot to replay the teleoperation instructions that cause the robot to perform the first reusable work primitive in the library of reusable work primitives includes generating processor-executable instructions that cause the simulated instance of the robot to replay the teleoperation instructions that cause the simulated instance of the robot to perform the first reusable work primitive in the simulated environment.~~

~~50. The method of claim 49~~24. The method of claim 21 wherein receiving teleoperation instructions that cause the simulated instance of the robot to perform the first reusable work primitive in the simulated environment includes receiving low-level teleoperation instructions that cause the simulated instance of the robot to emulate real physical actions performed by a real teleoperation pilot.

~~51.~~ 25. The method of claim ~~49~~21 wherein receiving teleoperation instructions that cause the simulated instance of the robot to perform the first reusable work primitive in the simulated environment includes receiving high-level teleoperation instructions that

cause the simulated instance of the robot to perform actions selected from a graphical user interface.

~~52.~~ 26. The method of claim ~~46~~21 wherein:

receiving teleoperation instructions that cause the robot to perform a first reusable work primitive in the library of reusable work primitives includes receiving a first set of teleoperation instructions that cause the robot to perform a first instance of the first reusable work primitive in the library of reusable work primitives and receiving a second set of teleoperation instructions that cause the robot to perform a second instance of the first reusable work primitive in the library of reusable work primitives; and

executing the teleoperation instructions to cause the robot to perform the first reusable work primitive in the library of reusable work primitives includes executing the first set of teleoperation instructions to cause the robot to perform the first instance of the first reusable work primitive in the library of reusable work primitives and executing the second set of teleoperation instructions to cause the robot to perform the second instance of the first reusable work primitive in the library of reusable work primitives.

~~53.~~ 27. The method of claim ~~52~~26 wherein generating processor-executable instructions that cause the robot to replay the teleoperation instructions that cause the robot to perform the first reusable work primitive in the library of reusable work primitives includes:

evaluating respective results of executing the first set of teleoperation instructions to cause the robot to perform the first instance of the first reusable work primitive in the library of reusable work primitives and executing the second set of teleoperation instructions to cause the robot to perform the second instance of the first reusable work primitive in the library of reusable work primitives to determine which of the first set of teleoperation instructions and the second set of teleoperation instructions produces a better result; and

generating processor-executable instructions that cause the robot to replay whichever of the first set of teleoperation instructions and the second set of teleoperation instructions that produces the better result.

~~54.~~ 28. The method of claim ~~52~~26 wherein generating processor-executable instructions that cause the robot to replay the teleoperation instructions that cause the robot to perform the first reusable work primitive in the library of reusable work primitives includes combining at least one element of the first set of teleoperation instructions and at least one element of the second set of teleoperation instructions in the processor-executable instructions that cause the robot to replay the teleoperation instructions that cause the robot to perform the first reusable work primitive in the library of reusable work primitives.

~~55.~~ 29. The method of claim ~~41~~21 wherein training the robot to autonomously perform each reusable work primitive in the library of reusable work primitives includes generating processor-executable instructions that, when executed by at least one processor of the robot, cause the robot to autonomously perform each reusable work primitive in the library of reusable work primitives, and the method further comprising:

delivering the processor-executable instructions to a non-transitory processor-readable storage medium of the robot.

~~56. A robot comprising:~~
~~a body;~~
~~at least one physically actuatable component mechanically coupled to the body; at least one processor communicatively coupled to the at least one physically actuatable component; and~~
~~at least one non-transitory processor-readable storage medium communicatively coupled to the at least one processor, the at least one non-transitory processor-readable storage medium storing a library of reusable work primitives and processor-executable instructions that, when executed by at least one processor, cause the robot to selectively and autonomously perform each reusable work primitive in the library of reusable work primitives, the processor-executable instructions trained by a process comprising:~~
~~generating a first simulated instance of the robot in a simulated environment; repeatedly executing processor-executable instructions to cause the first simulated instance of the robot to perform a first reusable work primitive in the library of reusable work primitives; refining the processor-executable instructions that cause the first simulated instance of the robot to perform the first reusable work primitive based on at least one result of repeatedly executing the processor-executable instructions to cause the first simulated instance of the robot to perform the first reusable work primitive; and~~

delivering the processor-executable instructions to the non-transitory processor-readable storage medium of the robot.

57. The robot of claim 56 wherein the process by which the processor-executable instructions are trained further comprises:
generating at least one additional simulated instance of the robot in the simulated environment;
repeatedly executing processor-executable instructions to cause the at least one additional simulated instance of the robot to perform the first reusable work primitive in the library of reusable work primitives; and
refining the processor-executable instructions that cause both the first simulated instance of the robot and the at least one additional simulated instance of the robot to perform the first reusable work primitive based on at least one result of repeatedly executing the processor-executable instructions to cause the first simulated instance of the robot and the at least one additional simulated instance of the robot to perform the first reusable work primitive.

58. A computer program product comprising:
a library of reusable work primitives; and
processor-executable instructions and/or data that, when the computer program product is stored in a non-transitory processor-readable storage medium of a robot system and executed by at least one processor of the robot system, the at least one processor communicatively coupled to the non-transitory processor-readable storage medium, cause the robot system to selectively and autonomously perform each reusable work primitive in the library of reusable work primitives, the processor-executable instructions trained by a process comprising:
generating a first simulated instance of the robot in a simulated environment; repeatedly executing processor-executable instructions to cause the first simulated instance of the robot to perform a first reusable work primitive in the library of reusable work primitives;
refining the processor-executable instructions that cause the first simulated instance of the robot to perform the first reusable work primitive based on at least one result of repeatedly executing the processor-executable instructions to cause the first simulated instance of the robot to perform the first reusable work primitive; and
delivering the processor-executable instructions to the non-transitory processor-readable storage medium of the robot.

59. The computer program product of claim 58 wherein the process by which the processor-executable instructions are trained further comprises:
generating at least one additional simulated instance of the robot in the simulated environment;
repeatedly executing processor-executable instructions to cause the at least one additional simulated instance of the robot to perform the first reusable work primitive in the library of reusable work primitives; and

refining the processor-executable instructions that cause both the first simulated instance of the robot and the at least one additional simulated instance of the robot to perform the first reusable work primitive based on at least one result of repeatedly

executing the processor-executable instructions to cause the first simulated instance of the robot and the at least one additional simulated instance of the robot to perform the first reusable work primitive.