CLAIMS

1. A system, comprising:

a memory that stores computer executable components; and

a processor that executes the following computer executable components stored in the memory, wherein the computer executable components comprise:

a receiving component that receives a quantum program for performing a quantum task, wherein the quantum program includes a first program and a second program;

an adaptive compiling component that compiles the first program;

an executing component that executes the compiled first program;

a second receiving component that receives an output based on executing the compiled first program;

a second adaptive compiling component that compiles the second program based on the received output from executing the first program;

a second executing component that performs an adaptive execution of the compiled second program; and

the first and the second adaptive quantum compilations are optimized for two different specific backends with different features and noise quality and are redirected to the respective backends for execution,

wherein the receiving component recompiles the compiled first program into a first recompiled program adapted to execute on a first quantum hardware device.

2. The system of claim 1, further comprising a determining component that employs one or more circuit outputs applied to one or more circuit inputs.

3. The system of claim 1, wherein the first program is defined based on a previously generated one or more outputs from the first program.

4. The system of claim 1, wherein the second program is defined based on a previously received one or more outputs from the second program.

5. The system of claim 1, wherein receiving the output is based on executing the recompiled first program.

6. The system of claim 1, wherein recompiling the compiled first program into a second recompiled program is adapted to execute on a second quantum hardware device.

7. The system of claim 6, wherein receiving a second output is based on executing the recompiled second program.

8. The system of claim 1, wherein compiling the second program is based on selecting either the output or a second output.

9. A computer-implemented method, comprising:

receiving, by a system operatively coupled to a quantum program for performing a quantum task, wherein the quantum program includes a first program and a second program;

compiling, by the system, the first program;

executing, by the system, the compiled first program;

receiving, by the system, an output based on executing the compiled first program;

compiling, by the system, the second program based on the received output from executing the first program;

performing an adaptive execution, by the system, the compiled second program;

optimizing, the first and the second adaptive quantum compilations for two different specific backends with different features and noise quality and redirecting to the respective backends for execution; and

recompiling, by the system, the compiled first program into a first recompiled program adapted to execute on a first quantum hardware device.

10. The computer implemented method of claim 9, further comprising:

determining, by the system, one or more circuit outputs that are applied to one or more circuit inputs.

11. The computer implemented method of claim 9, further comprising:

employing, by the system, the first program which is defined based on a previously generated one or more outputs from the first program.

12. The computer implemented method of claim 9, further comprising:
employing, by the system, the second program which is defined based on a previously received one or more outputs from the second program.

13. The computer implemented method of claim 9, further comprising:
receiving, by the system, the output based on executing the recompiled first program.

14. The computer implemented method of claim 9, further comprising:
recompiling, by the system, the compiled first program into a second recompiled program adapted to execute on a second quantum hardware device.

15. The computer implemented method of claim 14, further comprising:
receiving, by the system, a second output based on executing the recompiled second program.

16. The computer implemented method of claim 9, further comprising:
compiling, by the system, the second program based on selecting either the output or a second output.

17. A computer program product facilitating a quantum adaptive execution of quantum circuits, the computer program product comprising a computer readable storage medium having program instructions embodied therewith, the program instructions executable by a processor to cause the processor to:

receive, by the processor, a quantum program for performing a quantum task, wherein the quantum program includes a first program and a second program;

compile, by the processor, the first program;

execute, by the processor, the compiled first program;

receive, by the processor, an output based on executing the compiled first program;

compile, by the processor, the second program based on the received output from executing the first program;

perform an adaptive execution, by the processor, the compiled second program;

optimize, the first and second adaptive quantum compilations for two different specific backends with different features and noise duality and redirect to the respective backends for execution; and

recompile, by the processor, the compiled first program into a first recompiled program adapted to execute on a first quantum hardware device.

18. The computer program product of claim 17, wherein the program instructions are further executable by the processor to cause the processor to:
determine, by the processor, one or more circuit outputs that are applied to one or more circuit inputs.

19. The computer program product of claim 17, wherein the program instructions are further executable by the processor to cause the processor to:
employ, by the processor, the first program which is defined based on a previously generated one or more outputs from the first program.

20. The computer program product of claim 17, wherein the program instructions are further executable by the processor to cause the processor to:
employ, by the processor, the second program which is defined based on a previously received one or more outputs from the second program.

21. The computer program product of claim 17, wherein the program instructions are further executable by the processor to cause the processor to:
receive, by the processor, the output based on executing the recompiled first program.

22. The computer program product of claim 17, wherein the program instructions are further executable by the processor to cause the processor to:
recompile, by the processor, the compiled first program into a second recompiled program adapted to execute on a second quantum hardware device.