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; ~~and~~

~~————————~~a second executing component that ~~executes~~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.

2. ~~——~~The system ~~according to the preceding~~ of claim 1, further comprising a determining component~~, wherein the determining component~~ that employs one or more circuit outputs ~~that are~~ applied to one or more circuit inputs.

3. ~~——~~The system ~~according to any of the preceding claims~~of claim 1, wherein the first program is defined based on ~~the~~a previously generated one or more outputs from the first program.

4. ——The system ~~according to any of the preceding claims~~of claim 1, wherein the second program is defined based on ~~the~~a previously received one or more outputs from the second program.

5. ——The system ~~according to any of the preceding claims~~of claim 1, wherein the receiving component recompiles the compiled first program into a first recompiled program adapted to execute on a first quantum hardware device.

6. ——The system ~~according to the preceding~~ of claim 5, wherein receiving the ~~first~~ output is based on executing the recompiled first program.

7. ——The system ~~according to any~~ of ~~the two preceding claims~~ claim 1, wherein recompiling the compiled first program into a second recompiled program is adapted to execute on a second quantum hardware device.

8. ——The system ~~according to the preceding~~ of claim 7, wherein receiving a second output is based on executing the recompiled second program.

9. ——The system ~~according to any~~ of ~~the preceding claims~~ claim 1, wherein compiling the second program is based on selecting either the ~~received first~~output or ~~the received~~a second output.

10.—— A computer-implemented method, comprising:

————receiving, by ~~the~~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; ~~and~~

——— ~~executing~~performing an adaptive execution, by the system, the compiled second program~~.~~; and

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.

11. —— The computer implemented method ~~according to the preceding~~ of claim 10, further comprising:

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

12. —— The computer implemented method ~~according to any of the preceding claims~~of claim 10 ~~to 11~~, further comprising:

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

13. —— The computer implemented method ~~according to any of the preceding claims~~of claim 10 ~~to 12~~, further comprising:

———employing, by the system, the second program which is defined based on ~~the~~a previously received one or more outputs from the second program.

14. ——The computer implemented method ~~according to any of the preceding claims~~of claim 10 ~~to 13~~, further comprising:

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

15. —— The computer implemented method ~~according to the preceding~~ of claim 14, further comprising:

receiving, by the system, the first output based on executing the recompiled first program.

16. The computer implemented method according to any of the preceding claimsof claim 10 to 15, further comprising:

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

17. The computer implemented method according to the preceding of claim 16, further comprising:

receiving, by the system, thea second output based on executing the recompiled second program.

18. The computer implemented method according to any of the preceding claimsof claim 10 to 17, further comprising:

compiling, by the system, the second program based on selecting either the received firstoutput or the receiveda second output.

19. 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; and

executeperform an adaptive execution, by the processor, the compiled second program.; and

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.

20. The computer program product according to the preceding of claim 19, 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.

21. The computer program product according to any of the two preceding claims, 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 the previously generated one or more outputs from the first program.

22. The computer program product according to any of the three preceding claims claim 19, wherein the program instructions are further executable by the processor to cause the processor to:

employ, by the processor, the secondfirst program which is defined based on thea previously receivedgenerated one or more outputs from the secondfirst program.

22.23. The computer program product according to any of the four preceding claims claim 19, 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.

23. ~~—~~The computer program product of claim 19, 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 first recompiled program adapted to execute on a first quantum hardware device.

24. ~~—~~The computer program product ~~according to the preceding~~ of claim 23, wherein the program instructions are further executable by the processor to cause the processor to:

~~———~~receive, by the processor, the ~~first~~ output based on executing the recompiled first program.

25. ~~—~~The computer program product ~~according to any~~ of ~~the preceding claims~~ claim 19 ~~to 24~~, 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.