Companies Doing Portfolio Optimization

1) BlackRock
   Classical Algorithms: Mean-Variance Optimization, Black-Litterman Model.
   Quantum Algorithms: Yes, they have explored quantum computing for portfolio optimization through partnerships and research.

2) Goldman Sachs
   Classical Algorithms: Mean-Variance Optimization, Risk Parity, Factor Models.
   Quantum Algorithms: Yes, they have invested in quantum computing research and partnerships with quantum technology companies.

3) Morgan Stanley
   Classical Algorithms: Mean-Variance Optimization, Stochastic Programming, Scenario Analysis.
   Quantum Algorithms: They have been exploring quantum computing Algorithms and collaborating with quantum technology firms.

4) JP Morgan Chase
   Classical Algorithms: Mean-Variance Optimization, Black-Litterman Model, Dynamic Programming.
   Quantum Algorithms: Yes, they are actively researching and developing quantum computing applications for portfolio optimization.

5) HSBC
   Classical Algorithms: Mean-Variance Optimization, Multi-Objective Optimization, Genetic Algorithms.
   Quantum Algorithms: They have shown interest in quantum computing for financial applications and have been exploring its potential.

6) Fidelity Investments
   Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Factor Models.
   Quantum Algorithms: They have been investigating quantum computing applications for portfolio optimization and other financial services.

7) Vanguard
   Classical Algorithms: Mean-Variance Optimization, Risk Parity, Scenario Analysis.
   Quantum Algorithms: No public information on quantum Algorithms for portfolio optimization.

8) Charles Schwab
   Classical Algorithms: Mean-Variance Optimization, Factor Models, Monte Carlo Simulations.
   Quantum Algorithms: No public information on quantum Algorithms for portfolio optimization.

9) Robo-Advisors (e.g., Betterment, Wealthfront)
   Classical Algorithms: Mean-Variance Optimization, Goal-Based Investing Algorithms.
   Quantum Algorithms: No public information on quantum Algorithms for portfolio optimization.

10) IBM
    Classical Algorithms: Mean-Variance Optimization, Genetic Algorithms, Stochastic Programming.
    Quantum Algorithms: Yes, IBM is heavily invested in quantum computing and offers quantum Algorithms for portfolio optimization through IBM Quantum.

11) D-Wave Systems
    Classical Algorithms: N/A (Focused on quantum Algorithms).
    Quantum Algorithms: Yes, D-Wave specializes in quantum computing and provides quantum Algorithms for portfolio optimization.

12) 1QBit
    Classical Algorithms: N/A (Focused on quantum Algorithms).
    Quantum Algorithms: Yes, 1QBit focuses on developing quantum computing software for various applications, including portfolio optimization.

13) QxBranch (now part of Rigetti Computing)
    Classical Algorithms: N/A (Focused on quantum Algorithms).
    Quantum Algorithms: Yes, QxBranch specializes in quantum computing Algorithms, including those for portfolio optimization.

14) Zapata Computing
    Classical Algorithms: N/A (Focused on quantum Algorithms).
    Quantum Algorithms: Yes, Zapata Computing provides quantum algorithms and software for portfolio optimization and other applications.

15) QC Ware
    Classical Algorithms: N/A (Focused on quantum Algorithms).
    Quantum Algorithms: Yes, QC Ware develops quantum algorithms for portfolio optimization and collaborates with financial institutions.

16) Citigroup
    Classical Algorithms: Mean-Variance Optimization, Black-Litterman Model, Scenario Analysis.
    Quantum Algorithms: Exploring quantum computing through partnerships and research.

17) Barclays
    Classical Algorithms: Mean-Variance Optimization, Risk Parity, Factor Models.
    Quantum Algorithms: Involved in quantum computing research and collaborations.

18) UBS
    Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Genetic Algorithms.
    Quantum Algorithms: Exploring quantum computing applications.

19) Credit Suisse
    Classical Algorithms: Mean-Variance Optimization, Dynamic Programming, Scenario Analysis.
    Quantum Algorithms: Researching quantum computing for financial applications.

20) Deutsche Bank
    Classical Algorithms: Mean-Variance Optimization, Factor Models, Stochastic

Programming.
Quantum Algorithms: Collaborating with quantum technology companies.

21) BNP Paribas
Classical Algorithms: Mean-Variance Optimization, Multi-Objective Optimization, Genetic Algorithms.
Quantum Algorithms: Engaged in quantum computing research.

22) Societe Generale
Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Factor Models.
Quantum Algorithms: Investigating quantum computing applications.

23) Wells Fargo
Classical Algorithms: Mean-Variance Optimization, Black-Litterman Model, Scenario Analysis.
Quantum Algorithms: Researching quantum computing Algorithms.

24) Bank of America
Classical Algorithms: Mean-Variance Optimization, Risk Parity, Factor Models.
Quantum Algorithms: Exploring quantum computing for portfolio optimization.

25) TD Ameritrade
Classical Algorithms: Mean-Variance Optimization, Goal-Based Investing Algorithms.
Quantum Algorithms: No public information on quantum Algorithms.

26) Raymond James
Classical Algorithms: Mean-Variance Optimization, Factor Models, Monte Carlo Simulations.
Quantum Algorithms: No public information on quantum Algorithms.

27) Invesco
Classical Algorithms: Mean-Variance Optimization, Risk Parity, Scenario Analysis.
Quantum Algorithms: No public information on quantum Algorithms.

28) State Street
Classical Algorithms: Mean-Variance Optimization, Black-Litterman Model, Factor Models.
Quantum Algorithms: Exploring quantum computing applications.

29) Northern Trust
Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Stochastic Programming.
Quantum Algorithms: Investigating quantum computing Algorithms.

30) T. Rowe Price
Classical Algorithms: Mean-Variance Optimization, Scenario Analysis, Factor Models.
Quantum Algorithms: No public information on quantum Algorithms.

31) Pimco
Classical Algorithms: Mean-Variance Optimization, Black-Litterman Model, Dynamic Programming.
Quantum Algorithms: Exploring quantum computing applications.

32) Franklin Templeton
Classical Algorithms: Mean-Variance Optimization, Multi-Objective Optimization, Genetic Algorithms.
Quantum Algorithms: No public information on quantum Algorithms.

33) AllianceBernstein
Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Factor Models.
Quantum Algorithms: Exploring quantum computing Algorithms.

34) AXA Investment Managers
Classical Algorithms: Mean-Variance Optimization, Risk Parity, Scenario Analysis.
Quantum Algorithms: Investigating quantum computing applications.

35) Man Group
Classical Algorithms: Mean-Variance Optimization, Genetic Algorithms, Black-Litterman Model.
Quantum Algorithms: Exploring quantum computing Algorithms.

36) Millennium Management
Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Stochastic Programming.
Quantum Algorithms: Researching quantum computing applications.

37) Citadel
Classical Algorithms: Mean-Variance Optimization, Factor Models, Scenario Analysis.
Quantum Algorithms: Exploring quantum computing Algorithms.

38) Two Sigma
Classical Algorithms: Mean-Variance Optimization, Genetic Algorithms, Black-Litterman Model.
Quantum Algorithms: Researching quantum computing for portfolio optimization.

39) Point72 Asset Management
Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Factor Models.
Quantum Algorithms: Investigating quantum computing applications.

40) Bridgewater Associates
Classical Algorithms: Mean-Variance Optimization, Risk Parity, Scenario Analysis.
Quantum Algorithms: Exploring quantum computing Algorithms.

41) Renaissance Technologies
Classical Algorithms: Mean-Variance Optimization, Genetic Algorithms, Black-Litterman Model.
Quantum Algorithms: Researching quantum computing applications.

42) D.E. Shaw & Co.
Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Factor Models.
Quantum Algorithms: Exploring quantum computing Algorithms.

43) AQR Capital Management
Classical Algorithms: Mean-Variance Optimization, Risk Parity, Scenario Analysis.
Quantum Algorithms: Researching quantum computing applications.

44) Blackstone Group
Classical Algorithms: Mean-Variance Optimization, Genetic Algorithms, Black-Litterman Model.
Quantum Algorithms: Exploring quantum computing Algorithms.

45) KKR & Co.
Classical Algorithms: Mean-Variance Optimization, Monte Carlo Simulations, Factor Models.
Quantum Algorithms: Investigating quantum computing applications.

46) Amundi
Classical: Risk parity, Factor-based models
Quantum: No public information on quantum implementations

47) Wellington Management
Classical: Multi-factor models, Scenario analysis
Quantum: No public information on quantum implementations

48) Schroders
Classical: Factor-based models, Scenario analysis
Quantum: No public information on quantum implementations

49) BNY Mellon Investment Management
Classical: Black-Litterman model, Scenario-based optimization
Quantum: No public information on quantum implementations

50) Arrowstreet Capital
Classical: Quantitative models, Statistical analysis
Quantum: No public information on quantum implementations

Summary
Many traditional financial institutions like BlackRock, Goldman Sachs, and JP Morgan Chase utilize classical algorithms such as Mean-Variance Optimization, Black-Litterman Model, Risk Parity, and Factor Models for portfolio optimization. Several of these companies are also exploring or actively developing quantum Algorithms for this problem, often in collaboration with quantum technology firms.
On the other hand, companies focused solely on quantum computing, such as IBM, D-Wave Systems, and Zapata Computing, are dedicated to creating quantum algorithms and Algorithms specifically for portfolio optimization.