1 Table S1

The following table represents an extended, combined version of Table 8-10 in the review paper. Here, the respective approaches used to solve the various problems are named additionally.

Table 1: Treated CO problems and associated solution approaches

Problem/Domain	**Mapping/Class**	**Solution Approach**
Air Traffic Management	Conflict-Resolution Problem	QA: [1]:QA
	Max-Cut	QAOA/VQE: [2, 3, 4, 5, 6, 7, 8, 9, 10, 11]: QAOA [12]: VQE [13]: Large-Scale QAOA [14]: encodings and mixer for QAOA on Max-k-Cut [15]: QAOA and RQAOA with qudits [16]: CVar for VQE and QAOA [17]: ascending CVar for VQE and QAOA [18]: RQAOA [19]: warm-starting and RQAOA [20]: ADAPT-QAOA [21, 22, 23]: reinforcement learning for parameters in QAOA [24]: machine learning approaches as classical optimizer in QAOA [25]: QAOA without outer loop optimization [26]: symmetry exploration for QAOA [27]: warm-starting QAOA with classical SDP QA: [28]: QA and molecular dynamics Others: [29]: FALQON [30]: DQAS [31]: reinforcement learning for ansatz search of VQA [32]: different ansätze for VQA

Table 1: Treated CO problems and associated solution approaches

Problem/Domain	**Mapping/Class**	**Solution Approach**
	MIS	QAOA/VQE: [12]: VQE [16]: CVar for VQE and QAOA [33]: Quantum Alt. Op. Ansatz [34]: QAOA & Quantum Alternating Operator Ansatz
Smart charging electric vehicles	Max-k-Cut MWIS	QAOA/VQE: [35]: tailored QAOA
Cluster head selection Wireless scheduling Satellite scheduling	MWIS	QAOA/VQE: [36, 37, 38]: QAOA
Flight scheduling Frequency allocation Register allocation	Graph Colouring	QAOA/VQE: [39]: QAOA [40]: QAOA&VQE [41]: XY-mixer for QAOA QA: [39, 42, 43]: QA Others: [44]: Grover
	Graph Partitioning	QAOA/VQE: [45]: LSTM for finding parameters within Quantum Alternating Operator Ansatz [46]: constraints encodings for QAOA Others: [47]: Multilevel approach [48]: Quantum Ready

Table 1: Treated CO problems and associated solution approaches

Problem/Domain	**Mapping/Class**	**Solution Approach**
	k-Comm. Detection	QAOA/VQE: [49]: Layer-VQE [50]: Multistart approach for QAOA QA: [51]: one-hot encoding [52]: density based community detection Others: [53]: Quantum Local Search [47]: Multilevel approach [54]: adapted Louvain algorithm
	consensus clustering	QA: [55]: simulated QA
	Vertex Cover	QAOA/VQE: [56]: constraints encodings for QAOA [46]: constraints encodings for QAOA [57]: problem-specific parametrized quantum circuits for VQE
	Maximum Clique	QA: [58]: QA [59]: problem-specific decomposition Others: [60]: Gaussian Boson Sampling
Satellite sub-constellation assignment	Weighted k-Clique	QA: [61]: various decomposition techniques
	Minimum Multicut Problem	QA: [62]
	Linear Assignment Problem	QAOA/VQE: [63]: VQE
	Dense Subgraph Ident.	QAOA/VQE: Others: [60]: Gaussian Boson Sampling
	Graph Similarity	Others: [64]: QAOA [60]: Gaussian Boson Sampling

Table 1: Treated CO problems and associated solution approaches

Problem/Domain	**Mapping/Class**	**Solution Approach**
	Travelling Salesman	QAOA/VQE: [12]: VQE [57]: problem-specific parametrized quantum circuits for VQE QA: [65]: QA [66, 67]: Quantum Tabu Algorithm [61]: various decomposition techniques
	Knappsack Problem	QA: [65]:QA
	Quadratic Knappsack	QA: [68]: ADMM for treating inequality constraints
	Tiling Puzzle Problem	QA: [69]: QA
Vehicle Routing	QAOA/VQE: [70]: QAOA [71]: QAOA and VQE QA: [72, 65, 73]: QA [74]: decomposition techniques for integer quadratic fractional programming (IQFP) problems	
Social workers problem	Combination of Vehicle Routing and Scheduling	QAOA/VQE: [75]: VQE Others: [76]: quantum case-based reasoning
Multiple processor scheduling	Scheduling	QAOA/VQE: [46]: constraints encodings for QAOA
Binary paint shop problem	Scheduling	QAOA/VQE: [77]: QAOA without outer loop optimization

Table 1: Treated CO problems and associated solution approaches

Problem/Domain	Mapping/Class	Solution Approach
Traffic flow optimization	Scheduling	QA: [78]: QA [79, 80]: D-Wave hybrid solver service
	Jop-Shop Scheduling	QA: [74]: decomposition technique for mixed integer linear program (MILP) problems [81]: various modifications
Military maintenance	Jop-Shop Scheduling	QA: [61]: various decomposition techniques
Transaction scheduling	Scheduling	QA: [82, 83]: QA
Flight-gate ass. prob.	Scheduling	QAOA/VQE: [84]: Quantum Alt. Op. Ansatz
Nurse scheduling	Scheduling	QA: [85]: QA and reverse QA
Workflow scheduling	Scheduling	QA: [86]: QA
Railway dispatching problem	Scheduling	QA: [87]: QA
Robot routing	Routing	QA: [88], [89]: QA
	Network-flow optimization (e.g. routing)	QAOA/VQE: [90]: QED
	Number partitioning	QAOA/VQE: [12]: VQE [16]: CVar for VQE and QAOA [17]: ascending CVar for VQE and QAOA
Tail assignment problem	Exact Cover Set Partitioning	Others: [91]: Quantum computing within Branch and Price approach
	Set Packing	QAOA/VQE: [46]: constraints encodings for QAOA

Table 1: Treated CO problems and associated solution approaches

Problem/Domain	**Mapping/Class**	**Solution Approach**
	SAT Problems	QA: [92]: reinforcement learning to find penalty coefficients
	Max-2-SAT	QAOA/VQE: [8]: QAOA [45]: LSTM for finding parameters within QAOA [93]: QAOA as a bang-bang protocol
	Max-3-SAT / 3-SAT	QAOA/VQE: [12]: VQE [16]: CVar for VQE and QAOA QA: [94, 95]: QA [96]: reinforcement learning to find annealing schedules [97]: Monte-Carlo Tree Search with neural network to find annealing schedules
	Max-Sum Divers.	QA: [98]: QA
	Market Split Problem	QAOA/VQE: [12]: VQE [16]: CVar for VQE and QAOA
	Portfolio Optimization	QAOA/VQE: [16]: CVar for VQE and QAOA [17]: ascending CVar for VQE and QAOA [19]: Warm-starting QAOA QA: [99]: forward and reverse QA [100]: several modifications for benchmarking Others: [101]: Grover Adaptive Search
	Minimum 2-Sum Problem	Others: [102]: constrained and unconstrained QUBO local search

Table 1: Treated CO problems and associated solution approaches

Problem/Domain	**Mapping/Class**	**Solution Approach**
	Quadratic Assignment	Others: [102]: constrained and unconstrained QUBO local search
Garden optimization problem	Quadratic Assigment	QA: [103]: D-Wave QA and hybrid solver service
Item listing optimization problem	Quadratic Assignment	QA: [104]: problem-specific decomp. method
Facility location allocation	Quadratic Assigment	QAOA/VQE: [63] QA: [105]: QA
Unit commitment		QA: [105]: QA
Heat exchanger networks		QA: [105]: QA
Financial indexing		QAOA/VQE: [106]: hybrid approach
Transaction settlement		QAOA/VQE: [107]: extension to treat mixed binary optimization problems
Prediction of financial crashes		QA: [108]: QA
Partially occluded object detection		QAOA/VQE: [109]: symmetry exploitation and parameter regression
Manufacturing cell formation		QA: [74]: decomposition method for mixed integer quadratic program (MIQP) problems
Online advertisement allocation		QA: [110]: PyQUBO
Logistics network design		QA: [111]: QA combined with SA
Model-predictive control		QA: [112]: QA

Table 1: Treated CO problems and associated solution approaches

Problem/Domain	**Mapping/Class**	**Solution Approach**
Election poll forecasting		QA: [113]
Molecular conformation		QA: [74]: QA with qbsolv
Image acquisition planning with satellites		QA: [114]: QA
Black-box optimization		QA: [115]: QA
Identification of dominant eigenpair of a matrix		Others: [116]: quantum power method

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