Table 1: QQN vs Non-QQN Optimizer Comparison Matrix

QQN Optimizer	Adam	Adam-AMSGrad	Adam-Fast	Adam-WeightDecay	GD	GD-Momentum	GD-Nesterov	GD-WeightDecay	L-BFGS	L-BFGS-Aggressive	L-BFGS-Conservative	Trust Region-Adaptive	Trust Region-Conservative	Trust Region-Standard
QQN-Backtracking	51W-1L-7T	52W-1L-6T	46W-4L-12T	47W-3L-11T	36W-3L-16T	47W-6L-12T	36W-3L-19T	27W-5L-27T	16W-1L-28T	46W-8L-10T	25W-5L-31T	47W-6L-12T	52W-8L-7T	45W-1L-13T
QQN-Bisection-1	55W-2L-2T	55W-2L-2T	61W-4L-12T	48W-3L-8T	30W-1L-19T	49W-6L-10T	36W-3L-20T	31W-6L-22T	29W-0L-26T	43W-6L-16T	26W-3L-30T	49W-6L-10T	54W-6L-5T	48W-1L-10T
QQN-Bisection-2	48W-1L-7T	49W-1L-7T	46W-7L-10T	47W-3L-12T	39W-3L-15T	46W-6L-11T	36W-4L-17T	32W-6L-19T	27W-1L-28T	46W-0L-17T	26W-2L-27T	45W-6L-12T	50W-4L-7T	44W-1L-12T
QQN-CubicQuadraticInterpolation	49W-2L-6T	49W-2L-6T	36W-8L-12T	41W-7L-11T	34W-8L-17T	44W-6L-15T	34W-4L-10T	24W-12L-22T	25W-1L-26T	36W-2L-10T	17W-14L-28T	63W-6L-14T	51W-8L-6T	42W-1L-12T
QQN-GoldenSection	53W-2L-4T	52W-2L-5T	41W-7L-11T	43W-3L-14T	36W-3L-18T	34W-1L-6T	37W-4L-20T	30W-6L-20T	16W-3L-30T	36W-2L-19T	22W-6L-31T	49W-6L-10T	52W-6L-6T	45W-0L-14T
QQN-MoreThuente	36W-9L-12T	36W-9L-12T	23W-21L-11T	26W-16L-17T	27W-17L-15T	26W-12L-19T	24W-17L-14T	22W-19L-16T	14W-5L-36T	34W-6L-25T	14W-18L-27T	37W-2L-26T	49W-11L-10T	36W-5L-16T
QQN-StrongWolfe	52W-2L-7T	52W-2L-5T	41W-4L-14T	44W-2L-12T	36W-3L-16T	46W-6L-11T	36W-3L-20T	30W-5L-25T	16W-3L-28T	41W-6L-16T	24W-4L-28T	46W-6L-12T	52W-6L-7T	46W-6L-12T

Legend: W = Wins (statistically significant better performance), L = Losses (statistically significant worse performance), T = Ties (no significant difference). Green indicates QQN variant dominance, red indicates non-QQN dominance.