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**Programming and Tuning a Quantum Annealing Device to Solve Real World Problems** ALEJANDRO PERDOMO-ORTIZ, BRYAN O’GORMAN, JOSEPH FLUEGEMANN, VADIM SMELYANSKIY, NASA Ames Research Center — Solving real-world applications with quantum algorithms requires overcoming several challenges, ranging from translating the computational problem at hand to the quantum-machine language to tuning parameters of the quantum algorithm that have a significant impact on the performance of the device. In this talk, we discuss these challenges, strategies developed to enhance performance, and also a more efficient implementation of several applications. Although we will focus on applications of interest to NASA’s Quantum Artificial Intelligence Laboratory, the methods and concepts presented here apply to a broader family of hard discrete optimization problems, including those that occur in many machine-learning algorithms.

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