**Quantum-Inspired Genetic Algorithm or Quantum Genetic Algorithm: Which Is It?** ERIKA JONES, George Mason University — Our everyday work focuses on genetic algorithms (GAs) related to quantum computing where we call "related" algorithms those falling into one of two classes: (1) GAs run on classical computers but making use of quantum mechanical (QM) constructs and (2) GAs run on quantum hardware. Though convention has yet to be set with respect to usage of the accepted terms quantum-inspired genetic algorithm (QIGA) and quantum genetic algorithm (QGA), we find the two terms highly suitable respectively as labels for the aforementioned classes. With these specific definitions in mind, the difference between the QIGA and QGA is greater than might first be appreciated, particularly by those coming from a perspective emphasizing GA use as a general computational tool irrespective of QM aspects (1) suggested by QIGAs and (2) inherent in QGAs. We offer a theoretical standpoint highlighting key differences–both obvious, and more significantly, subtle–to be considered in general design of a QIGA versus that of a QGA.

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