**Dalal Sukkari**  
King Abdullah University of Science and Technology, Thuwal, KSA, in the Division of Computer, Electrical, and Mathematical Sciences and Engineering, at the Extreme Computing Research Center.  
Dalal.Sukkari@kaust.edu.sa

The **KAUST SVD (KSVD)** is a high performance software framework for computing a dense SVD on distributed-memory manycore systems. The KSVD solver relies on the polar decomposition using the QR Dynamically-Weighted Halley algorithm (QDWH), introduced by Nakatsukasa and Higham (SIAM Journal on Scientific Computing, 2013). The computational challenge resides in the significant amount of extra floating-point operations required by the QDWH-based SVD algorithm, compared to the traditional one-stage bidiagonal SVD. However, the inherent high level of concurrency associated with Level 3 BLAS compute-bound kernels ultimately compensates the arithmetic complexity overhead and makes KSVD a competitive SVD solver on large-scale supercomputers.

Please see the handout for more details about KSVD.