UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD.
Petitioner

v.

BELL NORTHERN RESEARCH, LLC
Patent Owner

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Patent No. 8,416,862

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**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 8,416,862**

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Ex. 1041	Delosme, J. M., "Bit-level systolic algorithm for the symmetric eigenvalue problem," in *[1990] Proceedings of the International Conference on Application Specific Array Processors*, pp. 770-781 (IEEE September 1990).
Ex. 1042	Kota, K., *Architectural, numerical and implementation issues in the vlsi design of an integrated cordic-svd processor* (Doctoral dissertation, Rice University, 1991.
Ex. 1043	Kota, K., & Cavallaro, J. R., "A Normalization Scheme to Reduce Numerical Errors in Inverse Tangent comptations on a Fixed-point CORDIC Processor," in *IEEE International Symposium on Circuits and Systems (ISCAS)*, pp. 244-247 (May 1992).
Ex. 1044	Lee, J. A., & Lang, T., "Constant-factor redundant CORDIC for angle calculation and rotation," *IEEE Transactions on Computers*, (8), 1016-1025 (August 1992).

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