1067-42-1298 **Palle E. T. Jorgensen** (jorgen@math.uiowa.edu), Department of Mathematics, The University of Iowa, Iowa City, IA 52242, and **Myung-Sin Song*** (myungsin.song@gmail.com), Department of Mathematics and Statistics, Southern Illinois University Edwardsville, Box 1653, Edwardsville, IL 62026. *Matrix Factorization and Lifting.*

As a result of recent interdisciplinary work in signal processing (audio, still-images, etc), a number of powerful matrix operations have led to advances both in engineering applications and in mathematics. Much of it is motivated by ideas from wavelet algorithms. The applications are convincing measured against other processing tools already available, for example better compression (details below). We develop a versatile theory of factorization for matrix functions. By a matrix valued function we mean a function of one or more complex variables taking values in the group $GL(n, \mathbf{C})$ of invertible $n \times n$ matrices. Starting with this generality, there is a variety of special cases, also of interest, for example, one variable, or restriction to the case $n = 2$; or consideration of subgroups of $GL(n, \mathbf{C})$ or $SL(n, \mathbf{C})$, i.e., specializing to the case of determinant equal to one. A factorization theorem and sketch its application to signal(image processing) in the framework of multiple frequency bands will be shown. (Received September 20, 2010)