Leah A. Balay-Wilson* (lbalaywi@smith.edu), Yixin Bao and Hana Foe. Exploring Adinkras and Clifford Algebra representations.

In this research, we constructed a family of graphs that we called oriented chromotopologies. The adjacency matrices of these graphs correspond to representations of $Cl(0,m)$, a subset of the Clifford algebras. As these Clifford algebra representation matrices can be large, the graphs can significantly shorten computational time.

A different family of graphs called adinkras have previously been used for the same purpose with $Cl(n,0)$. Prior research has linked adinkras to set error-correcting codes. We show a method of deriving oriented chromotopologies from the same types of codes used for adinkras, and in fact a more general set of error-correcting codes. We then define a series of operations on oriented chromotopologies that correspond to specific basis changes in the adjacency matrices. This allows oriented chromotopologies to serve as a graphical method for showing isomorphism between representations. We then present a series of novel proofs to legitimize these operations. (Received September 16, 2014)