Enzo Wendler* (enzo.wendler@wsu.edu). \(\alpha\)-adjacency- A generalization of Skew Adjacency.

B. Shader and W. So introduced the idea of the skew adjacency matrix. Their idea was to give an orientation \(\delta\) to a simple undirected graph \(G\) from which a skew adjacency matrix \(S(G^\delta)\) is created. The \(\alpha\)-adjacency matrix extends this idea to an arbitrary field \(F\). To study the underlying undirected graph, the average \(\alpha\)-characteristic polynomial can be created by averaging the characteristic polynomials over all the possible orientations. In particular, a Harary-Sachs theorem for the average \(\alpha\)-characteristic polynomial is derived and used to determine a few features of the graph from the average \(\alpha\)-characteristic polynomial. (Received September 17, 2019)