

1059-52-139

Catherine Stenson* (stenson@juniata.edu), Department of Mathematics, Juniata College,
1700 Moore St., Huntingdon, PA 16652. *A Zonotopal Interpretation of Power in Weighted Voting
Systems*. Preliminary report.

The states in the U.S. Electoral College, the parties in the Israeli Knesset, and the shareholders in a company are all players in weighted voting systems. Each player has a certain number of votes and casts them all for or against a proposal. The proposal passes if the total number of votes exceeds some quota. A player's influence is measured by the Banzhaf Power Index, which counts the ways in which a player's vote can be critical to passing a proposal. Two weighted voting systems are equivalent if they correspond to the same region in a particular hyperplane arrangement. We connect the Banzhaf Power Index to the coordinates of the vertices of the dual zonotope. We also give a geometric interpretation of changes in the quota. (Received February 22, 2010)