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We introduce a network structure on NBA players where individuals are connected when they play against each other during a period of time in an NBA game. Using readily available play-by-play data, we give weights to the network edges to allow for head-to-head comparisons between players based on in-game performance. Using this network structure, we formulate and solve a graph diffusion process to produce a ranking of players. We then compare and contrast the diffusion ranking with existing player rankings such as Player Efficiency Rating and Adjusted Plus-Minus, as well as with similar network based ranking systems used in other contexts including the methods of Keener and Colley, and Google PageRank. (Received September 17, 2013)