

**Title:** Judicious partitions of directed graphs

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**Abstract:**

The area of judicious partitioning, pioneered by Bollobas and Scott, considers the general family of problems in which one seeks to optimize multiple parameters simultaneously. In this vein, we prove that every directed graph with  $m$  edges and minimum outdegree at least 2 admits a bipartition  $V = V_1 \cup V_2$  of its vertex set in which the numbers of edges from  $V_1$  to  $V_2$  and from  $V_2$  to  $V_1$  are both at least  $(1/6 + o(1))m$ . We also prove that if the minimum outdegree is at least 3, then the constant can be increased to  $1/5$ . Both of these constants are best-possible, and provide asymptotic answers to a question of Alex Scott.

Joint work with Choongbum Lee and Benny Sudakov.