

# Linear-Size Constant-Depth Polylog-Threshold Circuits

**Prabhakar Ragde**

**Avi Wigderson**

## **Abstract**

We present a simple explicit construction giving unbounded fan-in circuits with  $O(n)$  gates and depth  $O(r)$  for the threshold function of  $n$  variables when the threshold is at most  $(\log n)^r$ , for any integer  $r > 0$ . This improves a result of Atjai and Ben-Or, who showed the existence of circuits of size  $n^{O(1)}$ . This is the highest threshold for which polynomial-size, constant-depth circuits are possible.