

Positional Games on vertex sets of Random Graphs

Adva Mond, Tel Aviv University

We consider the $(1 : b)$ Maker-Breaker H -game on the vertex set of a graph G , where H is a fixed graph and $b \geq 1$. In this game Maker and Breaker alternately claim vertices of G , where in each turn Maker claims b vertices and Breaker claims 1. Maker wins if in the end of the game the vertices he claimed span a copy of H . We study the $(1 : b)$ Maker-Breaker H -game played on the vertex set of the random graph $G \sim G(n, p)$, and focus on the cases $H = C_k$ and $H = K_k$. For each of these cases we establish the asymptotic order of the minimum value of p for which Maker typically wins the game. It turns out, similarly to the result about the edge-version of the same question, that the $(1 : 1)$ triangle-game behaves differently from all other $(1 : b)$ H -games where $H = C_k$ or $H = K_k$ and $b \geq 1$. In fact, in the triangle-game we prove a hitting-time result. We describe a fixed graph F such that w.h.p. in the random graph process, the graph becomes Maker's win at the exact same moment where the first copy of F appears as a subgraph.

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