1065-05-276 **Tobias Mueller*** (tobias@cwi.nl), centrum wiskunde & informatica, p.o. box 94079, 1090 GB amsterdam, Netherlands, and **Ross J Kang**. *Dot product representations of graphs.*

A graph G on n vertices is a k-dot product graph if there exist vectors $v_1, \ldots, v_n \in \mathbb{R}^k$ such that $v_i^T v_j \geq 1$ if and only if $ij \in E(G)$. The dot product dimension of G is the least k such that G is a k-dot product graph.

In this talk I will survey some results on dot product dimension, and sketch a proof that every planar graph has dot product dimension at most 4, and that there are planar graphs with dot product dimension equal to 4. This answers a question of Fiduccia et al. Time permitting, I will also sketch the proof that, for every $k \geq 2$ there are k-dot product graphs for which in every choice of vectors $v_1, \ldots, v_n \in \mathbb{R}^k$ exponentially many bits are needed to store these vectors in the memory of a computer. This answers a question of Spinrad.

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