Generalized Fibonacci Cubes

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The vertex set of the *Fibonacci cube* Γ_d, $d \geq 1$, is the set of all binary strings containing no two consecutive 1's. Two vertices are adjacent in Γ_d if they differ in precisely one bit. Fibonacci cubes form a class of graphs with many appealing properties. In this talk, *generalized Fibonacci cube* $Q_d(f)$ will be introduced as the graph obtained from the d-cube Q_d by removing all vertices that contain a given binary string f as a substring. In this notation, $\Gamma_d = Q_d(11)$. In the first part of the talk several properties of the generalized Fibonacci cubes will be explained (isometric embeddability into cubes, characterization of median closed generalized Fibonacci cubes, f-dimension of a graph). In the second part, asymptotic behavior of the number of strings f for which $Q_d(f)$ is isometric in Q_d will be treated—leading us to the area of combinatorics on words.

The first part of the talk concerns joint work with Aleksandar Ilić and Yoomi Rho, the second part is a joint work with Sergey Shpectorov.