Title: Vietoris–Rips and Čech complexes of hypercube graphs

Abstract: Let (X, d) be a metric space and $r \geq 0$ be a real number. The Vietoris-Rips complex of X with scale r is a simplicial complex on vertex set X, where a finite set $\sigma \subseteq X$ is a simplex if and only if diameter of σ is at most r. The Čech complex of X is the nerve complex of all closed balls of radius $\frac{r}{2}$ centered at elements of X, *i.e.*, it is a simplicial complex with vertices corresponds to each balls and a finite set σ is a simplex if the balls corresponding to elements of σ have non empty intersection.

The topology of these complexes has connection with several areas including combinatorial topology, geometric topology, data analysis, etc. In this talk, we discuss the Vietoris-Rips and Čech complexes of hypercube graphs.

A (finite) simplicial complex Δ is d-collapsible if it can be reduced to the void complex by repeatedly removing a face of size at most d that is contained in a unique maximal face of Δ. The collapsibility number of Δ is the minimum integer d such that Δ is d-collapsible. We also discuss the collapsibility numbers of Vietoris-Rips and Čech complexes of hypercube graphs.