Pattern Counts in Random Planar Maps

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Random planar maps have been studied from various aspects during the last 15 or 20 years, including various limiting distributions for several parameters of interest (such as the largest 2-connected component) and local Benjamini-Schramm limits as well as scaling limits. A pattern is a given planar map and we say that it appears in another map if it could be "cut out" just leaving a face. The simplest pattern is just an k-gons. It directly follows from the Benjamini-Schramm limit that the expected number of occurences of a given pattern is asympotically linear in the number of edges of the random map. However, it seems to be a challenging problem to provide a more precise limit law. The purpose of this talk is to give a survey on the results and methods that have used so far in order to settle this question. It is conjectured that there is always a central limit theorem - and all results so far support this conjecture. In particular in a recent joint work with Eva-Maria Hainzl and Nick Wormald we prove a central limit theorem for patten with a simple boundary.