1135-05-658 **Thomas Tucker*** (ttucker@colgate.edu), **Jonathan Gross** (gross@cs.columbia.edu) and **Toufik Mansour** (toufik@math.haifa.ac.il). *Imbedding statistics for linear families via Markov chains.* Preliminary report.

The *genus polynomial* for a finite graph G is the generating function $g_G(z) = \Sigma a_i z^i$, where a_i is the number of imbeddings of G in the surface of genus i. A *linear family* G_n of graphs is formed by taking n copies of the same graph G and forming a path of them by adding edges in the same way between one copy of G and the next. For any such linear family there is a *production* or *transfer* matrix $M(z)$ and initial vector $v(z)$ (all entries are polynomials in z with non-negative integer coefficients) such that the genus polynomials for the imbedding types of G_n are given by $M^n(z)v(z)$. The columns of $M(1)$ have constant column sum s so $(1/s)M(1)$ is a matrix for a Markov chain whose states are the imbedding types of the linear family. We show how to use the Jordan normal form for $M(1)$ to find the average genus of each imbedding type for each member of a linear family. (Received September 12, 2017)