1030-60-243 **Manuel E. Lladser*** (lladser@colorado.edu), The University of Colorado, Department of Applied Mathematics, ECOT Room #232 /or PO Box 526 UCB, Boulder, CO 80309-0526.

*Minimal Markovian embeddings of non-Markovian random strings.* Preliminary report.

Let $A$ be a finite set and $X$ a sequence of $A$-valued random variables. We characterize a wide class of adapted embeddings of $X$ (i.e. sequences of the form $R(X_1)$, $R(X_1, X_2)$, $R(X_1, X_2, X_3)$, etc with $R$ a transformation over finite length sequences) that result in a first-order homogeneous Markov chain. For any transformation $Q$ over finite length sequences, we show there exists a unique coarsest refinement $R$ of $Q$ in this class such that $R(X_1)$, $R(X_1, X_2)$, $R(X_1, X_2, X_3)$, etc is Markovian. (By coarsest refinement we mean that $R(u) = R(v)$ implies $Q(u) = Q(v)$ and that $R$ is a deterministic function of any other refinement of $Q$ that leads to a Markov process.) We propose one particular embedding $R$ that is amenable for tracking the generating functions of various statistics associated with the occurrence of regular patterns (i.e. patterns described by a regular expression on the alphabet $A$) in X. A toy example of a non-Markovian sequence of 0's and 1's is analyzed thoroughly and – despite all expectations for normality – discrete asymptotic distributions are established for the average number of 1's in $X_1, ..., X_n$, as $n$ tends to infinity. (Received August 04, 2007)