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**Xiaoyang Gu\*** ([xiaoyang@cs.iastate.edu](mailto:xiaoyang@cs.iastate.edu)), Department of Computer Science, 226 Atanasoff Hall, Ames, IA 50011. *Finite-State Dimension and Relative Frequencies*. Preliminary report.

This talk concerns the dimensions of classes of real numbers naturally defined using relative frequency-of-digit conditions. Some of the recent results on the Hausdorff dimension of these classes were proven using ergodic theory and latest techniques developed for multifractal analysis of dynamical systems. We prove stronger (finite-state) versions of those results and generalize them to both classical packing dimension and finite-state strong dimension by using simpler methods (finite-state gamblers). (This is joint work with Jack Lutz.) (Received August 30, 2005)