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Seth Pettie* (pettie@umich.edu), University of Michigan, EECS Department, 2260 Hayward St., Ann Arbor, MI 48109. *An Introduction to Davenport-Schinzel Sequences, Forbidden 0-1 Matrices, and Their Geometric Applications.*

The *forbidden substructure method* is an elegant technique for bounding the complexity of geometric objects or the running time of geometric or non-geometric algorithms. One simply (i) *transcribes* the object or algorithm execution as a sequence (or 0-1 matrix), (ii) shows that this sequence (or matrix) avoids some *forbidden substructure* σ , then (iii) applies an “off-the-shelf” bound on the length of any such σ -free sequence (or the density of a σ -free matrix). The power of the method rests on step (iii): having a large library of bounds on extremal properties of σ -free sequences/matrices.

Let $\text{Ex}(\sigma, n)$ be the maximum length of a sequence over an n -letter alphabet, none of whose subsequences are isomorphic to a sequence σ , or the maximum number of 1s in an $n \times n$ 0-1 matrix, none of whose submatrices contain the 0-1 matrix σ . In this talk I will give several examples of the forbidden substructure method in discrete geometry, then survey what is known about $\text{Ex}(\sigma, n)$ and the properties of σ that influence its growth. Open problems of interest to the speaker may be mentioned in passing, mumbled. (Received September 21, 2011)