DENSITY OF RATIONAL LANGUAGES UNDER INVARIANT PROBABILITY MEASURES

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ABSTRACT. In this talk, I will present recent results obtained in collaboration with Valérie Berthé and Dominique Perrin on the density of rational languages under shift invariant probability measures on spaces of two-sided infinite words. This notion of density generalizes a classical notion of density studied in formal languages and automata theory. The density of a language is defined as the limit in average (if it exists) of the probability that a word of a given length belongs to the language. I will explain how we establish the existence of densities for all rational languages under all shift invariant measures by combining tools from semigroup theory and ergodic theory. Moreover, I will explain how the proof leads to explicit formulas under certain conditions.

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