

# **Analytic Information and Learning Theory (Dedicated to my Friend Antonio Galves)**

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In this talk we first briefly review some results obtained in analytic information theory that led to very precise asymptotics of the minimax redundancy for some universal source coding. In particular we shall discuss minimax redundancy for memoryless and renewal sources. Then we go beyond this trodden path and attempt to apply analytic tools to some machine learning problems. In particular, we present some new results on regret for online regression with logarithmic loss. These problems are analyzed using tools of analytic combinatorics such as Fourier analysis, generating functions, singularity analysis, Mellin transform, the saddle point method, and analytic dePoissonization.