

研究、探讨

# Sugeno测度空间基于复样本的统计学习理论

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**摘要** 引入复 $g_\lambda$ 随机变量、准范数的定义, 给出了复 $g_\lambda$ 随机变量的期望和方差的概念及若干性质; 证明了基于复 $g_\lambda$ 随机变量的马尔可夫不等式、契比雪夫不等式和辛钦大数定律; 提出了Sugeno测度空间中复经验风险泛函、复期望风险泛函以及复经验风险最小化原则严格一致性等定义; 证明并构建了基于复 $g_\lambda$ 随机样本的统计学习理论的关键定理和学习过程一致收敛速度的界, 为系统建立基于复 $g_\lambda$ 随机样本的统计学习理论奠定了理论基础。

**关键词** [Sugeno测度空间](#) [准范数](#) [复经验风险最小化原则](#) [关键定理](#) [收敛速度的界](#)

分类号

## Statistical learning theory of complex samples on Sugeno measure space

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### Abstract

Firstly, the definitions of complex  $g_\lambda$  random variable and primary norm are introduced. Next the concepts and some properties of the mathematical expectation and variance of complex  $g_\lambda$  random variables are provided. Secondly, for complex  $g_\lambda$  random variables, a number of fundamental concepts such as e.g., Markov's inequalities, Chebyshev's inequalities and a Khinchine's law of large numbers are discussed. Finally, the definitions of the complex empirical risk functional, the complex expected risk functional and complex empirical risk minimization principle on Sugeno measure space are proposed. Then the key theorem of learning theory based on complex  $g_\lambda$  random samples is proved, and the bounds on the rate of uniform convergence of learning process are constructed. The investigations help lay essential theoretical foundations for the systematic and comprehensive development of the statistical learning theory of complex  $g_\lambda$  random samples.

**Key words** [Sugeno measure space](#) [primary norm](#) [complex empirical risk minimization principle](#) [the key theorem](#) [the bounds on the rate of convergence](#)

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