ULTRAPRODUCTS IN FUNCTIONAL ANALYSIS

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Ultraproduct constructions are a standard tool in several aspects of functional analysis. Good examples are given by "local characterizations" of Hilbert spaces, and more generally the spaces of the space of Lebesgue integrable functions. The main focus of this talk will be on applications of ultraproducts in the theory of von Neumann algebras. For example, Connes's celebrated work on classification makes intensive use of ultraproduct techniques. These ideas have more recently been reused in context studying central sequences in von Neumann algebras, and in Popa's very recent work on fundamental groups. The talk will conclude with applications of ultraproducts in connection with central limit theorems which allows to find estimates for finite matrices via ultraproducts and matrix models.

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