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On the boundedness of composition operators on reproducing kernel Hilbert spaces with analytic positive definte functions

In this talk,I will explain our result which says boundedness of composition operators of maps implies the maps are affine maps in certain situations. Our problem originally comes from the applied mathematics. Composition operators (Koopman operators) are classically investegated in the theory of function space and complex analysis, but, they have been getting popular in the context of machine leraning and data analysis these days. Besides, reproducing kernel Hilbert spaces with analytic positive definite functions on euclidean spaces are utilized in many fields in engeneering and statistics. On the other hand, although it is important to prove the relation between the properties of maps and those of composition operators of the maps to guruantee theoretical validity, such relation is currently not known very well. In some important situation, we prove that a map become an affine map if its composition operator is bounded on an RKHS associated with analytic positive definite functions on euclidean spaces. This is the joint work with Masahiro Ikeda (RIKEN/Keio University) and Yoshihiro Sawano (Tokyo metropolitan University/RKEN