

Reproducing kernels and Hilbert-Schmidt kernels on groups

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In this paper we discuss the theory of reproducing Hilbert spaces associated to reproducing kernels. We give some characterization of properties of reproducing kernels and we show that a Hilbert-Schmidt kernel is reproducing and construct the reproducing Hilbert space associated to a Hilbert-Schmidt kernel. We discuss a convolution kernel given by positive definite kernels and convolution operator associated to a positive definite kernel. We prove that the range of convolution operators associated to a Hilbert-Schmidt kernel coincides with the reproducing Hilbert space associated to its convolution kernel. Finally, we discuss an integral operator associated to kernels on a discrete group. We show that the integral operator associated to a Hilbert-Schmidt kernel with a summable positive sequence is Hilbert-Schmidt. We also discuss an inner product of convolution operators in the space of square summable sequences on a countable discrete group.