On the General Intertwining Lifting Problem – I

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Abstract

We consider the general intertwining lifting problem as formulated by Foias and which is connected to various interpolation problems in reproducing kernel Hilbert spaces. We reduce this general problem to the case where the operators involved are $n \times n$ block upper-triangular. As a consequence, we show that the causal commutant lifting problem and the general intertwining lifting (or extension) problems are equivalent. We also obtain a seemingly new commutant lifting result for the case where one of the operators involved is nilpotent and the other canonical block Jordan. Finally, as an application, we obtain a completely new proof for the Ceausescu-Carswell-Schubert result concerning extension of an operator that intertwine restrictions of isometries to an invariant subspace, while preserving the intertwining relation.

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