

# Characterization of Hilbert Space Operators and Their Applications

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## Abstract

The study of operators forms a very important aspect in functional analysis. In this, paper we present positivity and norms of operators in Hilbert spaces. We outline the theory of normal, self-adjoint and norm-attainable operators. We give results on norms of normal, norm-attainable and self-adjoint operators. We also consider numerical radius attainability of these operators. Lastly we explore their applications to forensics and ICT. We illustrate how useful these operators are to image processing which is fundamental in enhancement of security and forensic procedures.

**Keywords:** *Hilbert space, normality, norm-attainability, self-adjoint operators*