Operator Theory

Dr. Shankar P. studies advanced topics in **mathematics that deal with operators and their behavior in abstract spaces**. He works mainly in **functional analysis and operator theory**, which help us understand how certain mathematical transformations (called operators) act on spaces of functions.

One part of his research looks at **operator systems**, which are special subspaces of operator algebras. He studies their structure and properties, especially focusing on ideas like **hyperrigidity** which describes when an operator system is so tightly determined by its behavior that no other system can behave the same way without being identical. He also explores **boundary representations** and other ways to understand the limits and extreme behaviors of these systems.

In another part of his work, he studies **invariant subspaces**, which are parts of a space that remain unchanged when an operator is applied a key question in understanding how operators work. He also connects his research to **complex analysis**, by studying operators called composition operators and understanding how their behavior relates to geometric and convexity properties.

His work provides deeper insights into the structure of operators and their subspaces, which is important in areas like quantum mechanics, signal processing, and the mathematics of complex systems.