# Bratteli Diagrams - Abstract

SUBHRADEEP GHOSH

18 Apr, 2025

Bratteli diagrams are a special kind of multilayered graph. The idea was first introduced by Ola Bratteli in 1972. Bratteli diagrams appear in many different areas of mathematics. We will take a look at two such scenarios. One is in the decomposition of a tower of semi-simple algebras. We will also consider the example of the tower of algebras of $\mathbb{C}\mathfrak{S}_n, n \geq 1$. We will discuss briefly the weak and strong Gelfand pairs.

And the other one is in the representation theory of $SU_2$. Bratteli diagrams appear in the decomposition of $V^{\otimes k}$ (V is the vector space $\mathbb{C}^2$ over $\mathbb{C}$), where $SU_2$ is acting on it by diagonal action. We will discuss the representation graph of $SU_2$ which is a Dynkin diagram of type $A_{+\infty}$, which is a schematic representation of the Clebsch-Gordan formula. Then we will see how Bratteli diagram comes from the representation graph.

Hope to see you all. Thanks!