Abstract

Schubert Calculus over Finite Fields and Random Network Codes

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In random network coding we are looking at the transmission of information through a directed graph with possibly several senders and several receivers, where the underlying topology of the network is unknown. Since linear subspaces are invariant under any linear operations of the basis vectors we will use them as codewords. It is helpful (e.g. for decoding) to constrain oneself to subspaces of a fixed dimension, in which case we talk about *constant dimension codes*.

The subset of $\mathbb{F}_q^n$ of all subspaces of dimension k is called the Grassmannian, in which we use the subspace distance to determine error-correction properties of the code. Schubert calculus over finite fields is one way to analyze the Grassmannian, particularly the intersection behavior.

In the talk we will show how Schubert calculus over finite fields is useful for the construction of network codes.

References

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