

Research plan

Ayaka Shimizu

I study knots and links by studying their diagrams and local moves. I will continue the study above, and I will also study projections of links. The concrete plan of my research is as follows:

Applications of the warping polynomial

I would like to propose applications of the warping polynomial and the warping crossing polynomial, and define new polynomial invariants of knots. I will also study the warping polynomials of knot projections.

The warping polynomial is defined by using a labeling of edges of the diagram, and the warping crossing polynomial is defined by using a labeling of crossing points. Since these labels have a lot of information, I would like to study themselves by considering the signs.

Region unknotting number

I will study in more detail the region unknotting number of a knot. For example, I would like to understand the relation to other knot invariants, for example the genus and the unknotting number. I will explain a more detailed relation between the region unknotting number and the crossing number of a knot. I will study region crossing changes on link diagrams and graphs, and on diagrams on many kinds of surfaces, too.

Warp-linking degree and the complete splitting number

In [2], I considered the warp-linking degree and the complete splitting number of a link diagram, and raised a question about the relation of them. I will try solving the question by considering the results in [3]. I would like to understand the complete splitting number in more detail in terms of statistics like in [4].

Knot projections

I will define and study a labeling of knot projections, and also define the distance space of reduced knot projections with respect to the half-twisted splice. Then, I will apply them to knot diagrams and knots.