Research Plan

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(I) A study of applications to Topological data analysis(=TDA).

I work on extending persistent homology to multiparametric data, which was already written in 'Abstract of the results of my research'. Namely, I will study the subject of the representation theory of multidimensional persistence modules.

(I)-1: First, I would like to make a further investigation of our result [8], [14], [12] on multidimensional persistence modules, such as an extension of the theory, to complete an algorithm.

(I)-2: Second, I will study an extension of the robustness of persistent homologies for noises to multidimensional persistence modules. For the 1-dimensional version, refer to [9]. Note that robustness is one of the foundations of TDA and is needed to be the practical realization of multidimensional persistence modules.

(II) The others.

In addition, I try to find an interaction among theory of persistence modules, representation theory, and combinatorics.