

連続講義

Combinatorial Rigidity: Graphs and Matroids in the Theory of Rigid Frameworks

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10月2日(火)	10:30–12:00	(京都大学数理解析研究所 204号室)
10月3日(水)	10:30–12:00	(京都大学数理解析研究所 204号室)
10月5日(金)	10:30–12:00	(京都大学数理解析研究所 204号室)
10月9日(火)	10:30–12:00	(京都大学数理解析研究所 204号室)
10月10日(水)	10:30–12:00	(京都大学数理解析研究所 204号室)
10月12日(金)	10:30–12:00	(京都大学数理解析研究所 204号室)

In this series of lectures we first give an overview of the many branches and concepts of combinatorial rigidity. This field is concerned with rigidity, flexibility, and realizability properties of various kinds of frameworks. A d -dimensional bar-and-joint framework (also called geometric graph), for example, is a collection of rotatable joints — located at given points of the d -dimensional Euclidean space — connected by fixed-length rigid bars.

If the framework is not degenerate, these properties depend only on the underlying graph or hypergraph of the framework. Thus graph and matroid theoretical methods — sometimes combined with geometric or algebraic arguments — can be used to answer many of the basic questions.

In the second part we shall focus on the characterization of locally and globally rigid two-dimensional frameworks and illustrate the typical methods and results of this area. We shall also investigate related optimization problems and discuss the applications of these results in statics, sensor network localization problems, flexibility of molecules, and in other areas.

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