# 論文の内容の要旨

## 論文題目　Essays on Matching Theory
### (マッチング理論に関する研究)

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Chapter 1 considers a doctor-hospital match and the doctor-optimal stable mechanism in a matching-with-contract model. We show that, whenever the doctor-optimal stable mechanism exists, the mechanism is group strategy-proof if and only if it is efficient if and only if it is Maskin monotonic, all from the doctors' side. Moreover, with substitutes and the law of aggregate demand, we find that the mechanism is consistent if and only if it is efficient.

Chapter 2 considers a school choice problem under general priorities with ties. Priorities in practice are usually complex since a school ranks students equally or cares about an affirmative action policy. Thus, we do *not* specify a class of priorities already known, *but* abstractly treat all priorities that guarantee a stable matching for all students' preference profiles. For those priorities, it is unknown whether stable matchings are achievable in some equilibrium concept. We show that a stable correspondence is implementable in Nash equilibria. Then, we focus on the Pareto-frontier of stable matchings, which we call *constrained efficient stable*. We show that, under a reasonable assumption on priorities, a constrained efficient stable correspondence is Nash implementable if and only if it satisfies Maskin monotonicity. Finally, we identify a necessary and sufficient condition on priorities under which a constrained efficient stable correspondence is Nash implementable.

Chapter 3 considers a many-to-one matching problem with contracts (doctor-hospital match, for example). In reality, a choice behavior for hospitals seems to be complex due to an affirmative action policy or budget constraints. Under a general choice behavior reflecting such a policy or a constraint, there does not necessarily exist a stable and strategy-proof mechanism. Moreover, a class of choice behavior guaranteeing the existence of a stable and strategy-proof mechanism

may be much restricted (Hatfield, Kominers, and Westkamp (2021)). Hence, we instead focus on another equilibrium concept, Nash equilibria, to investigate implementation of stable matchings. We propose a necessary and sufficient condition, called *Richness*, on choice behavior for hospitals so that stable matchings are Nash implementable. As a corollary, we check that Richness does hold in matching without contracts, implying that stable matchings are in general Nash implementable in the model without contracts.

Chapter 4 considers a many-to-one matching problem (doctor-hospital matchings in the National Resident Matching Program, for instance) with a feasibility constraint. The feasibility constraint is certainly important because the set of matchings implementable are sometimes controlled by a policy maker such as the government, educational authority and so on, or restricted by employers' technologies behind (like firms' profit maximization behavior) or budget constraints and so on. The constraint here is described by quantitative distributions of matchings. We refine the notion of stability under the feasibility constraint, which we call *group stability*. We propose a necessary condition on the feasibility constraint under which a group stable matching exists for all preferences.