

科目コード/科目名 (Course Code / Course Title)	CA220/統計数学諸論 2 (Special Topics in Statistics 2)		
テーマ/サブタイトル等 (Theme / Subtitle)	Computational Algebra and Statistical Models		
担当者名 (Instructor)	間野 修平(MANO SHUHEI)		
学期 (Semester)	秋学期(Fall Semester)	単位 (Credit)	2単位(2 Credits)
科目ナンバリング (Course Number)	MAT3530	言語 (Language)	日本語 (Japanese)
備考 (Notes)	LC168 統計数学特論2、RC168 統計数学特論2と合同授業		

授業の目標(Course Objectives)

To know how computational algebra is used in study of discrete statistical models.

授業の内容(Course Contents)

After introducing some topics in computational algebra, how algebraic methods are used to study the discrete exponential family, a broad class of statistical models, is explained. Knowledge in statistics is not mandatory.

授業計画(Course Schedule)

1. Introduction
2. Primer of statistical concepts
3. Ideals and varieties (1)
4. Ideal and varieties (2)
5. Groebner basis (1)
6. Groebner basis (2)
7. Primary decomposition
8. Conditional independence
9. Discrete exponential family (1)
10. Discrete exponential family (2)
11. Polyhedral geometry
12. Markov basis (1)
13. Markov basis (2)
14. Summary

授業時間外(予習・復習等)の学習(Study Required Outside of Class)

Study resume.

成績評価方法・基準(Evaluation)

レポート試験(Report Exam)(70%)/中間レポート(midterm report)(30%)

テキスト(Textbooks)

なし

参考文献(Readings)

1. Cox, Little, O'Shea. 2007. Ideals, Varieties, and Algorithms, 3rd ed.. Springer (ISBN:9780387356501)
2. Sullivant. 2018. Algebraic Statistics. American Mathematical Society (ISBN:9781470435172)

その他(HP等)(Others(e.g.HP))

注意事項(Notice)