		Computational Learning Theory								
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Machine learning is known as fundamental technology in Artificial Intelligence. In this course we treat machine learning from discrete data and present its mathematical foundations based on formal language theory and theory of computation. First we introduce elements needed in formalizing machine learning, and then we explain learnability of various classes of formal languages in the models of identification in the limit and learning with queries, as well as models in first order logic. We also introduce some results presented recently in computational learning theory, including its relationship with ideals of polynomials.

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By taking this cpurse, students are expected to understand mathematical foundations of machine learning based on formal language theory and theory of computation.

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1. Machine learning from discrete data
2. Formal language theory and theory of computation
3. Learning regular languages from positive and negative data
4. Learning regular languages by positive data
5. Learning context-free languages by positive data
6. Characterizing learning from positive data
7. Learning regular languages with queries
8. Learning context-free languages with queries (1)
9. Learning context-free languages with queries (2)
10. Elementary formal system and learning
11. Learning pattern languages
12. Learning Boolean functions
13. Learning models in first-order logic
14. Refinement operators
15. Learning polynomial ideals in algebra

Contents would be modifed so that students could follow them better.
Students.

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Students are assumed to have fundamental knowledge on mathematics, in particular, set theory.

Computational Learning Theory(2)

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Students must submit exercise papers on some of the topics given in the course.

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Colin de la Higuera   Grammatical Inference: Learning Automata and Grammars   Cambridge University Press   ISBN:0521763169

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Every week, students should review the material (slides, documents..) provided in the lecture just one week before. (90min)

After every lecture, students should review the material provided in it and if they have any question, they should ask the lecturer.

Documents used in the course will be available on KULASIS.

KULASIS