

MA4198 PROJECT PROPOSAL (PROJECT CUM SEMINAR GROUP)

SUPERVISOR'S INFO

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TITLE

The Mathematics of AI

BRIEF DESCRIPTION OF PROJECT

The goal would be to understand the mathematical foundations that power the remarkable achievements of machine learning and artificial intelligence in recent years. Precise list of topics to be decided through discussions between the supervisor and the students and their interests. Examples of possible topics could be linear geometry and its applications to classification and dimension reduction; networks, random walks and the mathematics of web search; Markov systems and language models; random sampling and its applications to machine learning; the mathematics of sparsity and applications to image compression; basics of optimal transport and its applications; and so on.

EXPECTATION/S

Read and understand together as a group basic material on the topic, and to be able to explain the main ideas to each other and to the supervisor.

PREREQUISITE/S (at level 3000 or below, with at most one course at level 3000)

Basic linear algebra, basic calculus, basic probability

READING REFERENCE/S

Eg: Essential Math for AI by Hala Nelson; Ten Lectures and Forty-Two Open Problems in the Mathematics of Data Science by Afonso Bandeira