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Here's everything you need to know about the math for machine learning.

(+ free resources)



Before diving into the math, I suggest first having solid programming skills.

For example■

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In Python, these are the concepts which you must know:

- Object oriented programming in Python : Classes, Objects, Methods
- List slicing
- String formatting
- Dictionaries & Tuples
- Basic terminal commands
- Exception handling

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If you want to learn those concepts for python, these courses are freecodecamp could be of help to you.

■Basics:youtube■com/watch?v=rfscVS0vtbw

■Intermediate :youtube■com/watch?v=HGOBQPFzWko

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Python in 4 hours

Full Course

■ You need to have really strong fundamentals in programming, because machine learning involves a lot of it.

It is 100% compulsory.

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■ Another question that I get asked quite often is when should you even start learning the math for machine learning?

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■ Math for machine learning should come after you have worked on a project or two, doesn't have to be a complex one at all, but one that gives you a taste of how machine learning works.

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■ Here's how I do it, I look at the math when I have a need for it.

For instance I was recently competing in a Kaggle machine learning challenge.

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I was brainstorming about which activation function to use in a part of my neural net, I looked up the math behind each activation function and this helped me to choose the right one.

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The topics of math you'll have to focus on for machine learning

- Linear Algebra
- Calculus
- Trigonometry
- Algebra
- Statistics
- Probability

Now here are the resources and a brief description about them.

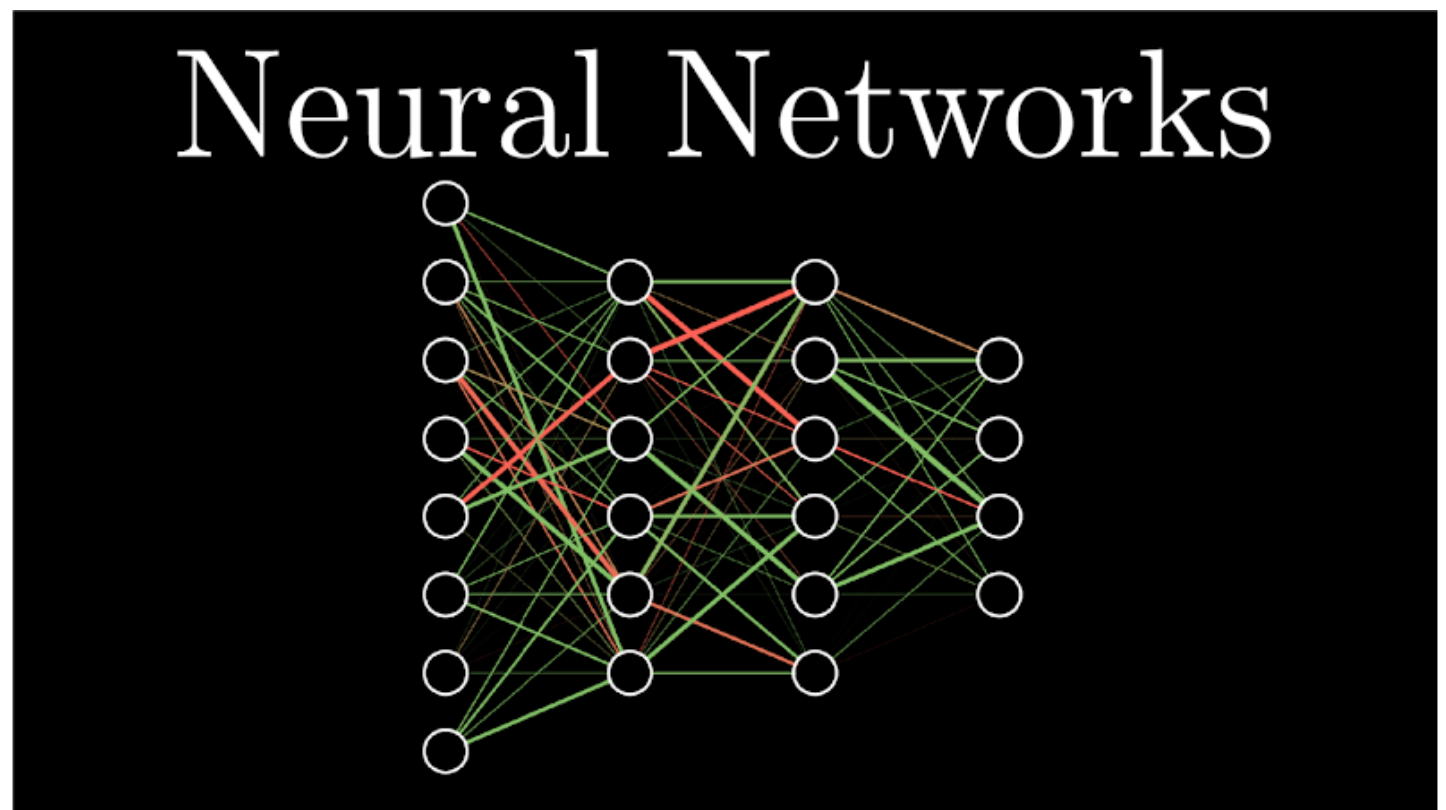
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Neural Networks

> A series of videos that go over how neural networks work with approach visual, must watch.

■ youtube.com/watch?v=aircAruvnKk&list=PLZHQObOWTQDNU6R1_67000Dx_ZCJB-3pi

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Seeing Theory

> This website helps you learn statistics and probability in an intuitive way.

■ seeing-theory.brown.edu/basic-probability/index.html

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Chapter 1

Basic Probability

This chapter is an introduction to the basic concepts of probability theory.



Chance Events



Expectation



Variance

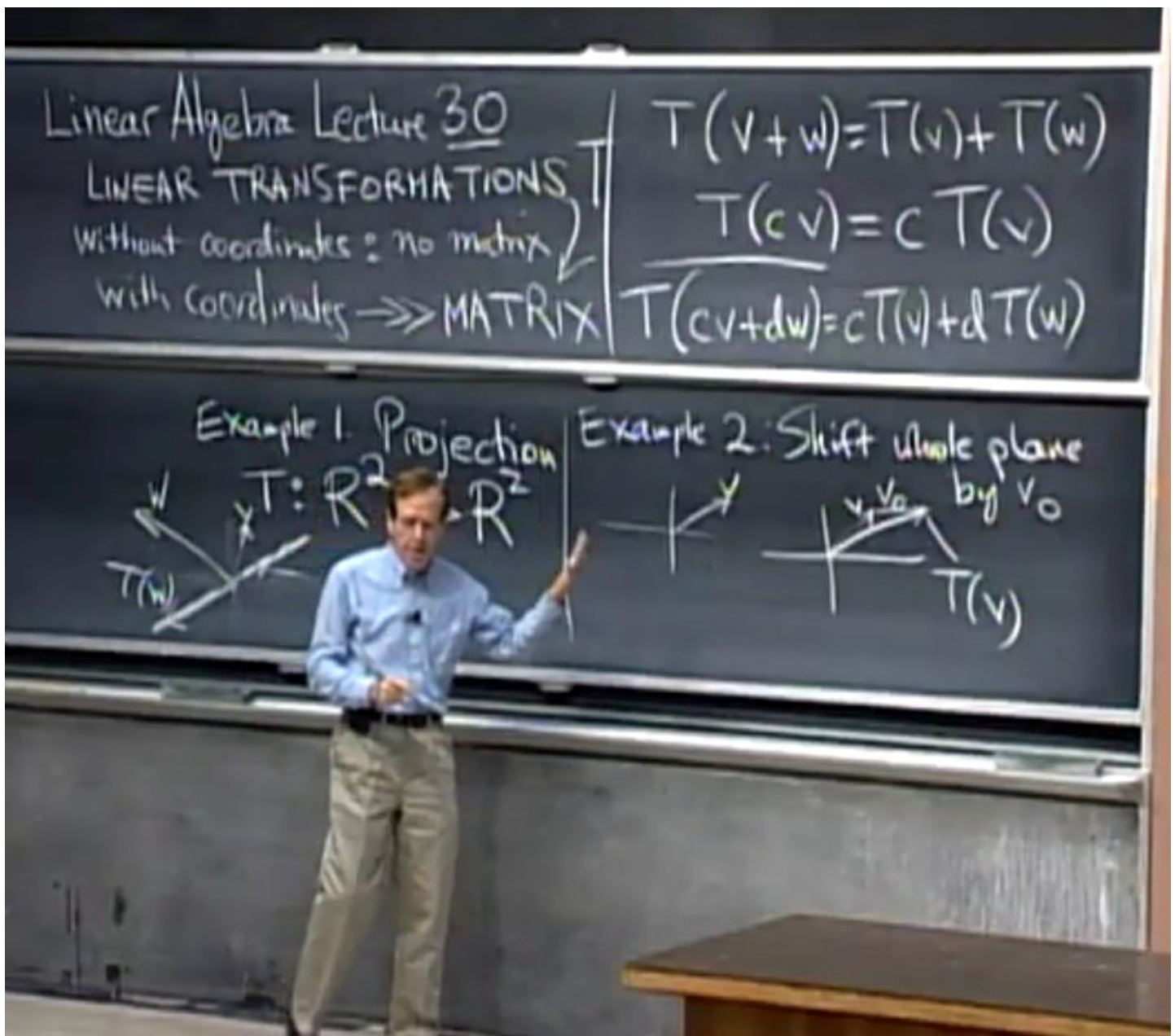
Gilbert Strang's lectures on Linear Algebra (MIT)

> This is 15 years old but still 100% relevant today!

Despite the fact these lectures are made for freshman college students at MIT, I found it very easy to follow

■ youtube.com/playlist?list=PL49CF3715CB9EF31D

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Essence of Linear Algebra

> A beautiful playlist of videos which teach you linear algebra through visualisations in an easy to digest manner

■ youtube.com/watch?v=fNk_zzaMoSs&list=PLZHQObOWTQDPD3MizzM2xVFitgF8hE_ab

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Essence of linear algebra

Khan Academy

>The resource you must refer to when you forget something or want to revise a topic super quick

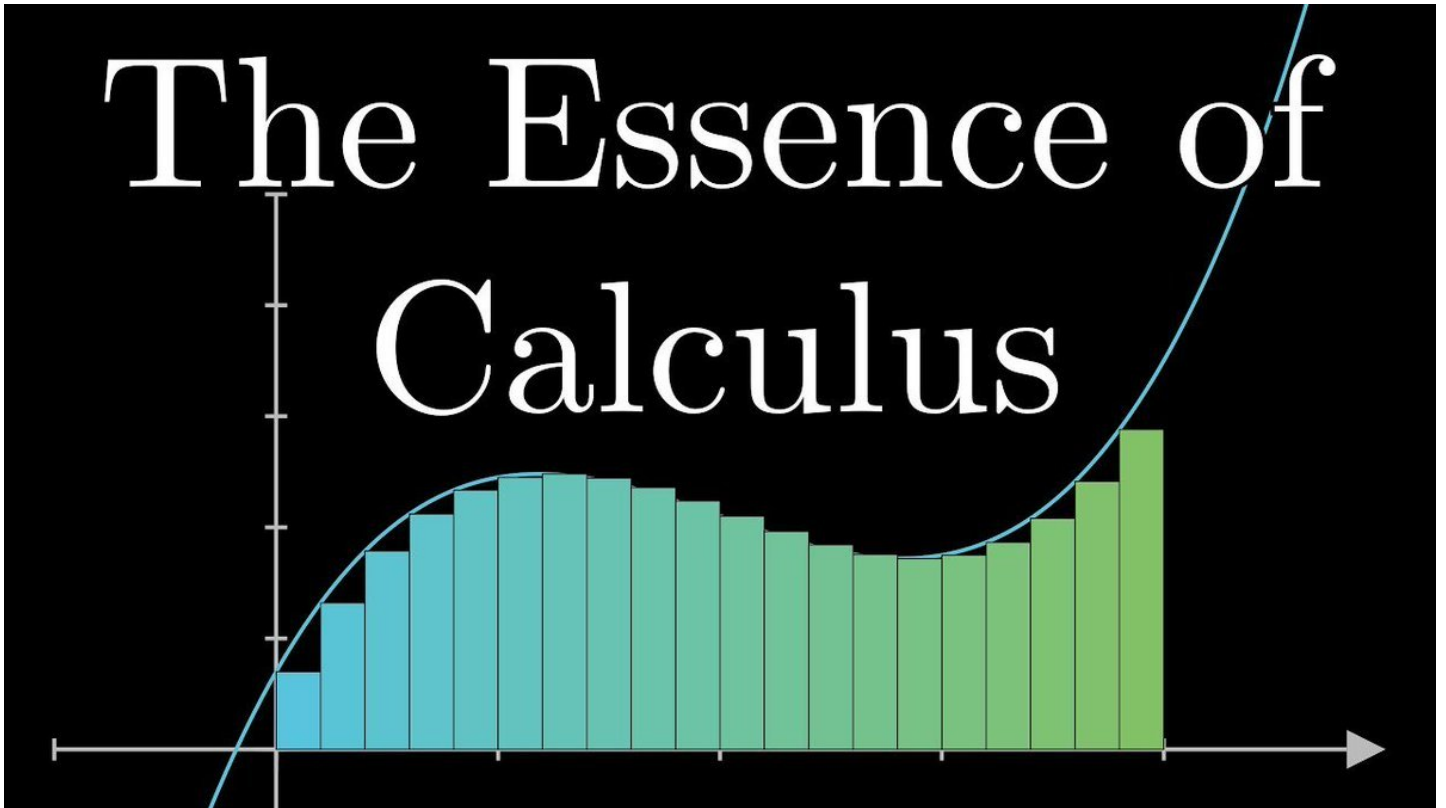
■ khanacademy.org/math

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Essence of calculus

> A beautiful series on calculus, makes everything seem super simple.



The math for Machine learning e-book

> This book is for someone who knows quite a decent amount of high school math like trigonometry, calculus, I suggest reading this after having the fundamentals down on khan academy.

[mml-book. github .io](https://mml-book.github.io)

Mathematics for Machine Learning

Companion webpage to the book "Mathematics for Machine Learning". Copyright 2020 by Marc Peter Deisenroth, A. Aldo Faisal, and Cheng Soon Ong. Published by Cambridge University Press.

View On
GitHub

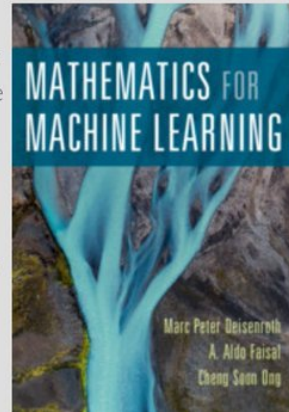
Please link to this site using <https://mml-book.com>.

Twitter: @mpd37, @AnalogAldo, @ChengSoonOng.

We wrote a book on Mathematics for Machine Learning that motivates people to learn mathematical concepts. The book is not intended to cover advanced machine learning techniques because there are already plenty of books doing this. Instead, we aim to provide the necessary mathematical skills to read those other books.

The book is available at [published by Cambridge University Press](#) (published April 2020).

We split the book into two parts:



If you found this thread helpful then don't forget to follow me, it takes a ton of effort to write these threads and your support keeps me going. ■■

Good luck in your machine learning journey!

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