Some resources to start with Fundamentals of Machine Learning

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With a number of courses, books and reading material out there here is a list of some which I personally find useful for building a fundamental understanding in Machine Learning.

Machine Learning at a higher level requires some mathematical prerequisites which are at the heart of it.

- Learning Theory
- Optimization
- Statistical learning and high dimensional probability theory.

Some really nice resources might be the ones below

1. Learning Theory
   (a) The initial chapters from Foundations of Machine Learning - Mohri, or
   (b) Part I from Understanding Machine Learning From Theory to Algorithms - Shai Shalev-Shwartz and Shai Ben-David (Video lectures)
   (c) Learning from Data - Caltech
2. Optimization for Machine Learning
   (a) Large scale optimization for Machine Learning - Talks by Suvrit Sra - Part 1, Part 2 and Part 3 (Slides)
   (b) Convex Optimization literature - Convex Optimization course by Stephen Boyd(Sides), and the classical book on Introductory Lectures on Convex Programming - Yuri Nesterov
   (c) Non-convex Optimization for Machine Learning - Jain and Kar
   (d) OPTML++ page by Suvrit Sra
3. Statistical Learning and Probabilistic Machine Lerning
   (a) Introduction to Statistical Learning - Trevor Hastie and Robert Tibshirani (Introductory Book, Advanced Book)
   (b) Machine Learning: A Probabilistic Perspective - Kevin P Murphy