

# **Principles for Building your Own Machine Learning Methods: From Theory to Applications to Practice**

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Machine Learning has greatly matured as a field the past 20-30 years or so. While it is now widely spread and used by researchers and business, the majority of the tools are “out of the box” ones, which have been developed for largely “general purpose problems” in some sense. The focus of this presentation will be to go back to some of the key theoretical principles of machine learning methods, and based on the “basics”, discuss examples of developing custom-based machine learning methods that may fit the needs of a specific problem/application. A few such “custom built” methods will be presented, with example applications ranging from understanding choices people make (e.g., purchase ones) to investing in stocks. Moreover, some part of the presentation will be spent on placing all recent advances in Machine Learning and AI in some broader context – of how they may, or may not fit in practice, whether it is in research, business, and more broadly in society. Research questions – beyond the “mathematics of machine learning” - will be discussed.