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ΔΙΑΛΕΞΗ

Mathematics for data-driven modeling - The science of crystal balls

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Περίληψη
In mathematical modeling one typically progresses from observations of the world (and some serious thinking!) to equations for a model, and then to the analysis of the model to make predictions. Good mathematical models give good predictions (and inaccurate ones do not) - but the computational tools for analyzing them are the same: algorithms that are typically based on closed form equations. While the skeleton of the process remains the same, today we witness the development of mathematical techniques that operate directly on observations -data-, and "circumvent" the serious thinking that goes into selecting variables and parameters and writing equations. The process then may appear to the user a little like making predictions by "looking into a crystal ball". Yet the "serious thinking" is still there and uses the same -and some new- mathematics: it goes into building algorithms that "jump directly" from data to the analysis of the model (which is never available in closed form) so as to make predictions.
I will present a couple of efforts that illustrate this new path from data to predictions. It really is the same old path, but it is travelled by new means.