# Lecture 2: The Learning Problem In Perspective
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## Description

We introduce the problem of learning from sparse examples. We introduce key terms and concepts such as loss functions, empirical risk, true risk, generalization error, hypothesis spaces, approximation error and sample error. We introduce two key requirements on learning algorithms: stability and consistency. We then describe Tikhonov regularization -- which in our course is the algorithm with the magic.

## Suggested Reading

- Cucker and Smale. **On the mathematical foundations of learning.** Bulletin of the American Mathematical Society, 2002.
- Evgeniou, Pontil and Poggio. **Regularization Networks and Support Vector Machines** Advances in Computational Mathematics, 2000.
- Vapnik. **The Nature of Statistical Learning Theory.** Wiley & Sons, 1995.