## Sampling & Resampling

## Handout 3 of Introduction to Machine Learning

## January 2020

Problem #1:	
You cannot measure all the things (	in the population).
Solution #1:	
Take a	
Problem #2:	
Your sample could be biased.	
Solution #2:	
Take a	sample.
Problem #3:	
But now you have to worry about sa	ampling
Why worry? Because it affects how	well your model can make accurate predictions
Solutions:	
1.	
2. 3.	
ე.	

Let's say $more\ flexible\ models$ is our only option. We cannot state have two new problems!	art over; we cannot get more data. Now we
Problems:	
1. Less flexible models tend to have more at the cost of missing some signal too)	(they may miss more noise, but
2. More flexible models tend have more at the cost of picking up too much noise)	(they may catch more signal, but
Why worry?	
1. It is really hard to do anything with modelgone)	(once the signal is gone, it is
2. Model, on the other hand, there, and the noise is estimable)	we have methods for (because the signal is
Solution:	
Bootstrapping: resampling from our	data with
Problem:	
But now you have many (re-)samples, and many models.	
Solution:	
Model	