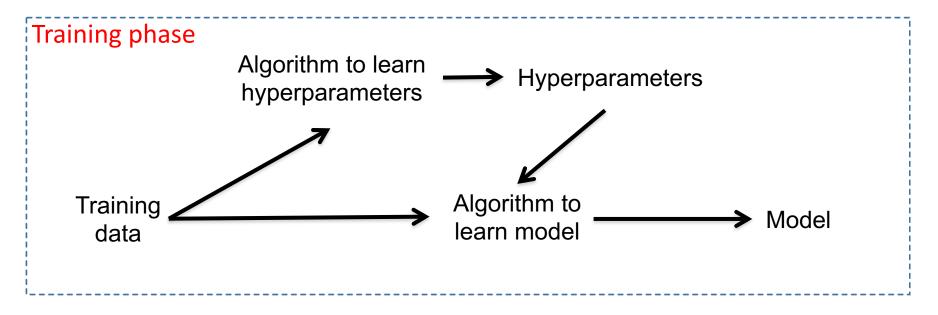
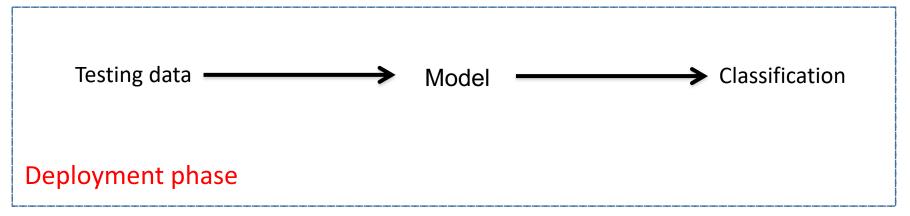
Data Poisoning Attacks to Classifiers

Neil Gong

Machine Learning Pipeline



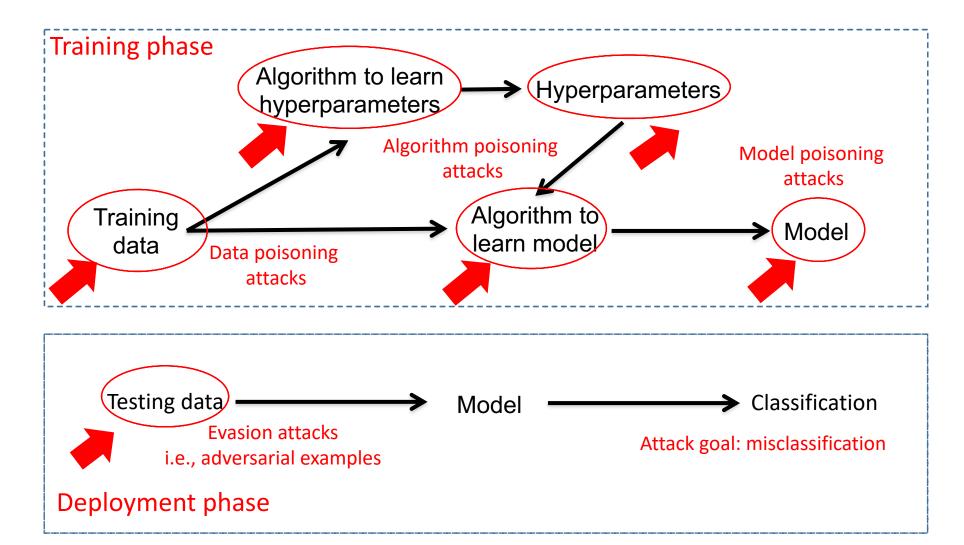


Security of Machine Learning

- Integrity
 - Training phase
 - Deployment phase

- Confidentiality
 - Training/testing data
 - Model parameters
 - Hyperparameters
 - Algorithms

Integrity of Machine Learning



Threat Model

- Attacker's goal
 - Untargeted: large testing error rate
 - Targeted: target label for target inputs
- Attacker's background knowledge
 - Training data
 - Algorithm
 - Neural network architecture
- Attacker's capability
 - Add training data
 - Delete training data
 - Modify training data

How to Perform Data Poisoning Attacks

- Untargeted attacks
 - Label flipping
 - Feature perturbation
 - Bi-level optimization problem
- Targeted attacks
 - Clean-label attacks in the feature space
 - Bi-level optimization problem

Untargeted Data Poisoning Attacks

