Security of Neural Networks : Attacks, Defenses and Evaluation methods

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Context

Overview

- **Neural networks**: state-of-the art performances in various complex tasks (e.g., image recognition, speech translation)
  $\rightarrow$ Growing will to deploy models on embedded systems




- **Adversarial machine learning**: Serious threats require efficient countermeasures
  - Critical decision systems (health, defense and security, . . .)
  - Autonomous car
  - . . .

Security of Machine Learning systems

Threat Model

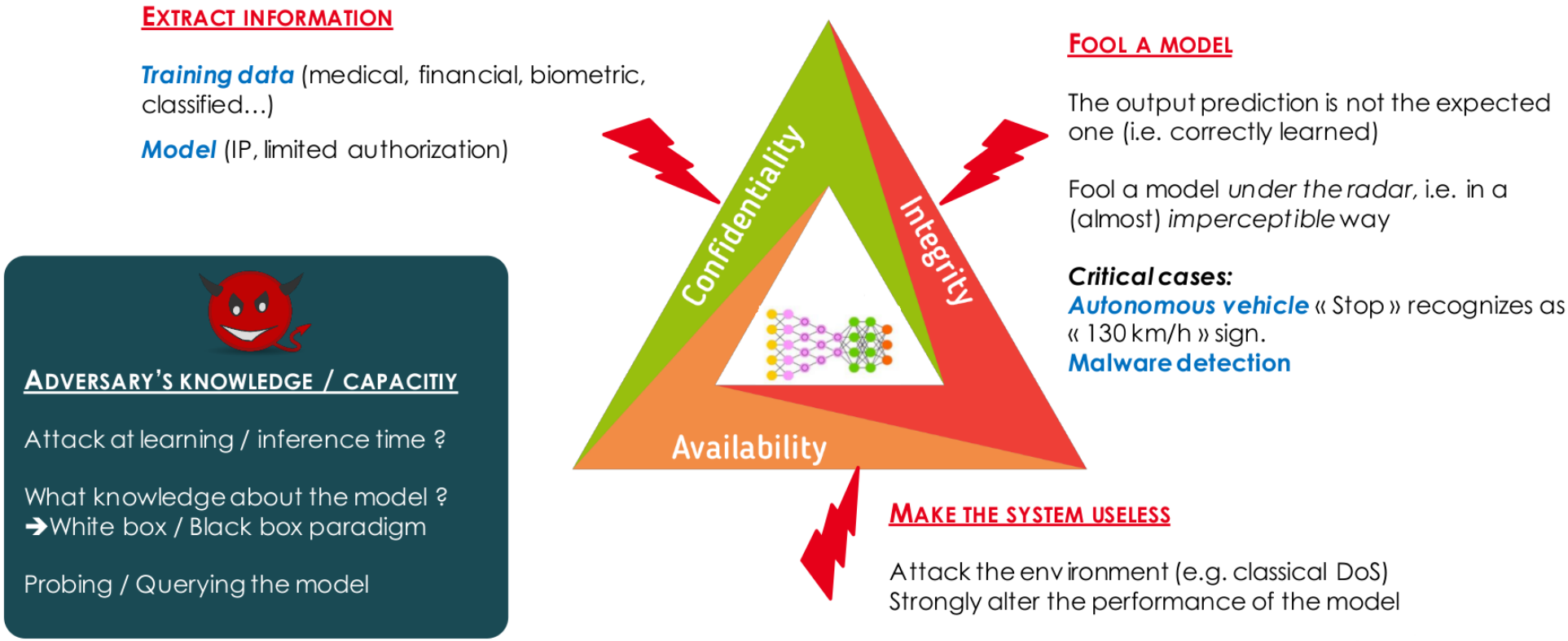
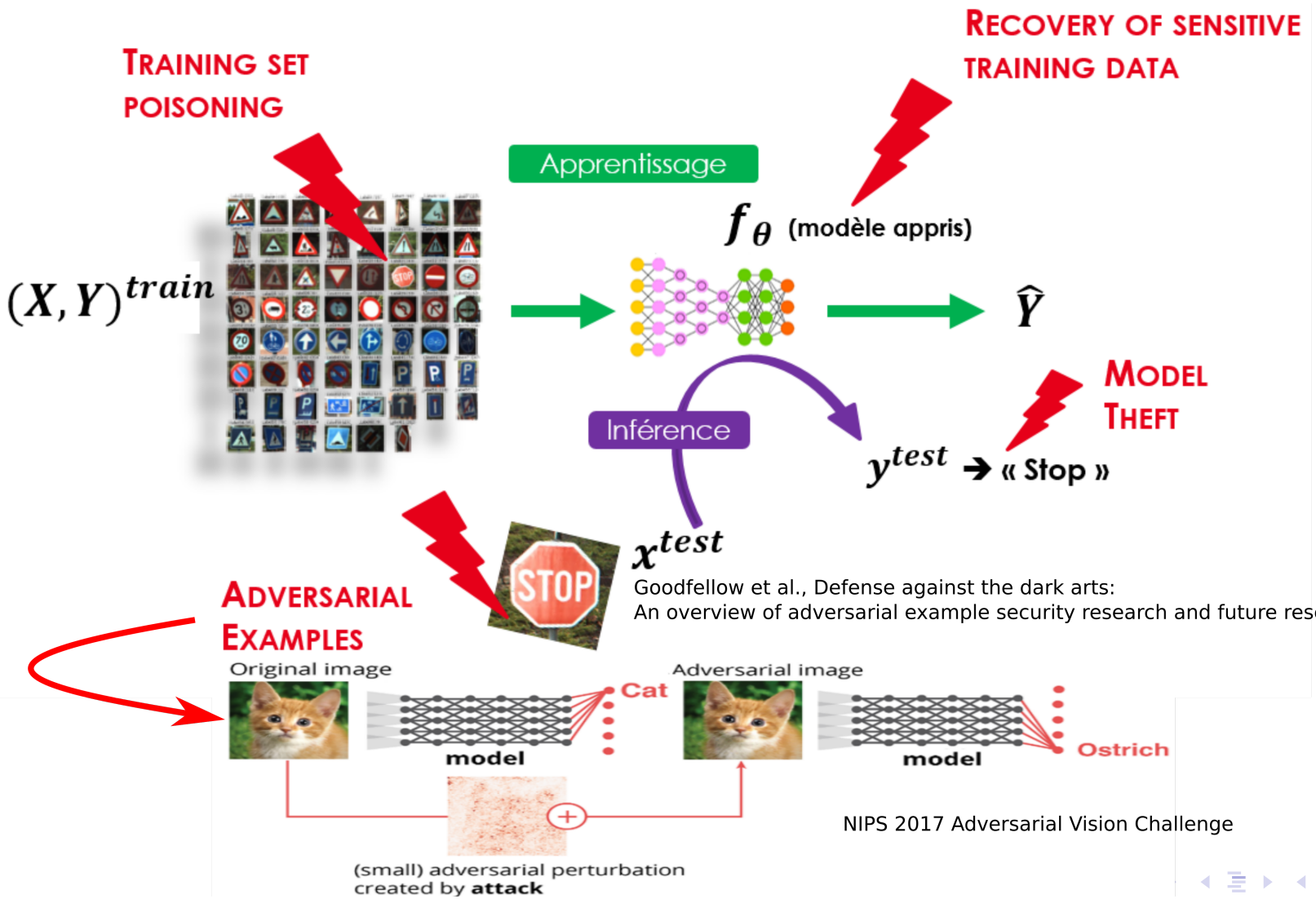


Figure: CIA threat model for a Machine Learning system

Security of Machine Learning Systems

Striking the ML pipeline



Goodfellow et al., Defense against the dark arts:
An overview of adversarial example security research and future research directions, 2018

NIPS 2017 Adversarial Vision Challenge