# OS Fingerprinting using ML

- **What is OS Fingerprinting:**
  - Process of detecting OSes of remote machines.
- **What we are doing:**
  - We are developing an OS fingerprinting system
  - The system employs Genetic Algorithm (GA) and Machine Learning (ML) techniques
- **Methodology:**
  - Data: instances of different OSes.
  - Genetic Algorithm: to select relevant features.
  - Machine Learning algorithms: to extract rules for OS Fingerprinting.

- **Advantages:**
  - The system is a single-packet classification system.
  - The system is the first OS classifier to adopt GA.
  - The system is completely machine learning dependant.
- **Algorithms being tested:**
  - J48, JRip, Ridor, PART
- **Fitness Functon:**

$$Fitness = 0.80 \times Accuracy +$$
$$0.15 \times \left(1 - \frac{|SelectedFeatures| - 1}{|AllFeatures| - 1}\right) +$$
$$0.05 \times \left(1 - \frac{|SelectedRules| - 1}{|AllRules| - 1}\right)$$