# Introduction to ML and PR

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Two top-tier journals for ML and PR research can be:

* Pattern Recognition letters
* The Journal of Pattern Recognition Research (JPRR)

Two top-tier conferences for ML and PR research can be:

* Computer Vision and Pattern Recognition (CVPR) arranged by IEEE (Institute of Electric and Electronic Engineers)

* European Conference on Computer Vision (ECCV)

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ML refers to compute the programms which can improve their performance Performance Measure [P] in some Tasks [T] by their own Experience [E]

ML has a more convervative approach than PR

ML data structures:

* Arrays
* Trees
* Graphs

PR:

* Eucledian space

Engineering Rules:

1. Approximate to a line
2. Use MSE(a,b) (Mean Squared Error)

You can find the minimum/maximum global value

**Google what kind of optimization functions Matlab provides. Can you find a suitable candidate for 1) linear programming, 2) unconstrained optimization (with gradient and without gradient information available) and 3) constrained optimization such as needed for SVM.**

* + Bayesian optimization
  + Adam optimization (adaptative learning rate technique)
  + Gradient descent with momentum
  + RMSprop
  + Gradient Descent

2)

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* Gradient descent
  + Stochastic gradient descent
  + Mini Batch gradient descent

1)

### Interior-Point linprog Algorithm

### Interior-Point-Legacy Linear Programming

### Dual-Simplex Algorithm

2)

Optimization with **Rosenbrock's Function**

3)

### Optimization Without Derivatives fminsearch

### Optimization with Estimated Derivatives fminunc

### Optimization with Steepest Descent fminunc/HessUpdate

### Optimization with Analytic Gradient fminunc/trust-region

### Optimization with Analytic Hessian

### Optimization with a Least Squares Solver

### Optimization with a Least Squares Solver and Jacobian