Gamifyr: Transforming Machine Learning Tasks into Games with Shiny

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Interactive Machine Learning

Jerry Alan Fails and Dan R. Olsen, Jr.

*Interactive machine learning.*
Interactive Machine Learning

Saleema Amershi, Max Chickering, Steven M. Drucker, Bongshin Lee, Patrice Simard, and Jina Suh. 
In *Proceedings of the ACM CHI 2015*
Gamification

"The use of game design elements in non-game context"
Gamification

Clear Measurable Performance Data

Friend's Leaderboard

Motivational Badges

My level:
Waze Knight, 2345 pts.
360 pts. to unlock next level

My rank: #456
Here's how you can move up the ranks...

Badges
43 avis (Auteur confirmé)
13 avis sur les hôtels
30 avis sur les restaurants
Avis dans 21 villes
8 votes utiles
20 avis d'explorateur
Given two classes $c_1$ and $c_2$, an object $o$ is assigned to category $c_1$ if the following inequality holds

$$P(o|c_2) < m P(o|c_1) + q$$
Math Background

$P(o|c_2) \leq mP(o|c_1) + q$

Coordinates of the object

Parameters the user can modify

more training = better estimate

more validation = better decision
Classification on a 2D plot

Objects Class $c_1$

$P(o \mid c_2)$

Decision Line

Objects Class $c_2$

$P(o \mid c_1)$
Gamify Classification

Objective:
• Find best line using as few resources as possible

Actions:
• Move line
• “Buy” training objects (more accurate)
• “Buy” validation objects (more objects)

Game Mechanics:
• Resources (chocolate essentially)
• Ranking ("top gear" ranking)
• Points (classification and resources)
Experiments

1. PhD and PostDoc students
   - Preliminary study

2. Kids of primary and secondary schools
   - European Researchers’ Night

3. People from different ages and background
   - Public event at the Banca d’Italia for the brand new 50 euro note
PhD Students

Gamify Classification

Username
mm

Start Game
Next Category

Resources available: 1778

Training
Validation

Clicks available: 15

Positive
Negative

Shift

Rotate

Best
Test

0.942 (current)
0.942 (best)
0.950 (goal)
Non-PhD Students
Punteggio: 79.4 %
Obiettivo: 95.0 %
L'obiettivo è raggiungere 95.0%.
Il tuo punteggio attuale è 77.5%.

Cliccare sul grafico per centrare la linea ed usare le frecce per spostarla.
Conclusions & Future Works

• Estimate of the cost for creating a training set
• Study the performance of classifier built by users

• Investigate different game scenarios
• Design a new interface for mobile devices