

# Pascal Symposium

## A Tour of the Pascal Challenge Programme

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# Let's discuss about challenges

Why, what for, how,...

What if we had to re-do it ?

Pascal-II

What a challenge cannot do

What was learned along Pascal Challenges:

next speakers

# Scientific Challenges

## Quite a few ML challenges

- ▶ DARPA, RoboCup
- ▶ TREC
- ▶ KDD Cup
- ▶ Netflix
- ▶ CAMDA, CASP



## Expected benefits

- ▶ assess existing approaches/technologies  
much cheaper than consultants
- ▶ push the state of the art
- ▶ raise the standards
- ▶ attract new researchers, give the opportunity of making oneself known
- ▶ facilitate multi-disciplinary dialogue

# Pascal Challenges, the Vision

Multi-modal interfaces  
User modelling

What was promised...

- ▶ Catalyst for research and application development
- ▶ Animation of scientific community

... was delivered to a reasonable extent

- ▶ Bridging the gap with neighbor communities
- ▶ Asking new questions
- ▶ ... revisiting common knowledge

# Bridging the gap – Applicative Challenges

## Vision(\*)

- Visual Object Classes

- Inferring Relevance from Eye movements

## Speech

- Speech Separation Challenge

- Human-machine comparison of consonant recognition

## Text(\*)

- Recognizing Textual Entailment

- ML Methodologies to extract patterns

- Unsupervised segmentation of words

- Computer-assisted Stemmatology

## BCI

- Brain Computer Interface III

## Web(\*)

- Mining XML documents

- Learning to Label a Graph

# Asking new questions – Exploratory Challenges

## New frontiers of the ML field

- ▶ Predictive uncertainty challenge
- ▶ Different training and test set distributions
- ▶ Online trading of Exploration/Exploitation
- ▶ Multiple Simultaneous Hypothesis Testing

## Argumenting their relevance

- ▶ Setting the trend

# Revisiting common knowledge

## Collective vs Individual priorities

- ▶ A necessity for the community  
*though not too often*
- ▶ A high risk for the individual



## Science is a social activity

- ▶ I have a solution – what is your problem ?  
*main problem is to select the dataset...*
- ▶ Hard to publish unexpected/negative results  
Journal of Interesting Negative Results

# Revisiting common knowledge, 2

## Dangerous topics / facing true believers

- ▶ Agnostic learning vs Prior knowledge
- ▶ Predicting the Learning Error

## Why challenges help

- ▶ A game with fair rules
- ▶ Clear objectives (no beauty in the eye of the beholder)
- ▶ Critical mass



# Various reasons why challenges can go wrong, and did

- ▶ The entry barrier is too high  
nobody comes in
- ▶ Need to have a baseline  
building one takes 3 years
- ▶ The assessment criterion is imprecise  
don't see what to do
- ▶ Not on my research agenda
- ▶ Legal issues

Let's not speak about

cheating

# Pascal I: What Challenges did bring in

- ▶ A set of enjoyable events
- ▶ New, large, challenging datasets
- ▶ New standards/topics – now internationally acknowledged
- ▶ Openness – member-of-the-club feeling

## The Legacy

- ▶ A new dataset repository
- ▶ An EasyChallenge tool

# Going further

## A co-evolution story

- ▶ A Challenge should neither be too hard nor too easy
- ▶ Can we calibrate the difficulty ?
- ▶ We have all evidence to find the most difficult examples
- ▶ Use this evidence:
  - ▶ To cluster the algorithms
  - ▶ For the sake of pedagogy

## Cognitive bias of algorithms ?

# Going further, 2

## The domains

- ▶ Societal issues
- ▶ Music
- ▶ Robotics
- ▶ e-Science
- ▶ ML for systems

## The rewards

- ▶ honor
- ▶ money
- ▶ free ticket to MLSS

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