Pascal Symposium

A Tour of the Pascal Challenge Programme

Michele Sebag
CNRS – INRIA – Université Paris-Sud
http://tao.lri.fr

Bled, January 28th, 2008
Let’s discuss about challenges

Why, what for, how, ...

What if we had to re-do it?

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
- push the state of the art
- raise the standards
- attract new researchers, give the opportunity of making oneself known
- facilitate multi-disciplinary dialogue

much cheaper than consultants
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
Thanks to

- Ido Dagan, Bernardo Magnini,
- Chris Williams, Andrew Zisserman, Luc Van Der Gool
- Isabelle Guyon
- Joaquin Quinonero-Candela
- Marko Grobelnik, Fortuna Blaz
- Ludovic Denoyer
- Neil Lawrence, Martin Cook, Guido Sanguinetti
- Mikko Kurimo
- Samuel Kaski
- Zakia Hussain, John Shawe-Taylor, Peter Auer
- Fabio Ciravegna, Benjamin Blankertz, David Barber, Bob Damper
- Florence d’Alché-Buc and Steve Gunn