Codalab

Open source platform to accelerate reproducible computational research

Evelyne Viegas, Isabelle Guyon, Sergio Escalera

CodaLab 2017 Community Leads

Percy Liang, Stanford

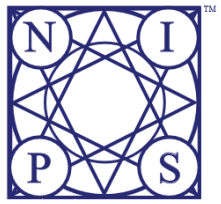
Sergio Escalera, U. of Barcelona, CV Center, ChaLearn

Isabelle Guyon, Paris-Saclay, ChaLearn

Xavier Baró Solé, U. Oberta de Catalunya, CV Center

Evelyne Viegas, Microsoft AI & Research

Eric Carmichael, CK Collab



CodaLab – Contributors

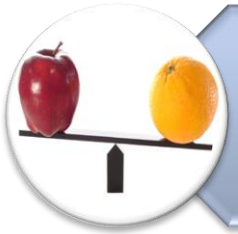
CodaLab has received important contributions from many people, and we would like to thank their efforts in making CodaLab what it is today:

Pujun Bhatnagar, Justin Carden, Richard Caruana, Francis Cleary, Sergio Escalera, Andrew Duffy, Ivan Judson, Lori Ada Kilty, Shaunak Kishore, Stephen Koo, Konstantin Kopyrev, Eric Li, Pragnya Maduskar, Simon Mercer, Arthur Pesah, Christophe Poulain, Lukasz Romaszko, Laurent Senta, Tyler Thomas, Cedric Vachaudez, Paul Viola, Erick Watson, Tony Yang, Flavio Zhingri, Michael Zyskowski.

What are the issues?

Duplication of Effort / No Shared Learning

Lack of Reproducibility / Inadequate Publication



No Comparable Baseline / Insufficient Collaboration

Instant Gratification! Inability to leverage work from challenges

What is needed

Reducing preparation time

Accelerating the pace of innovation

Reproducibility

Enabling sharing of approach, code, data

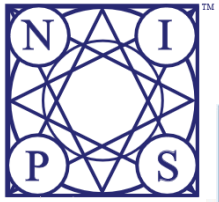
Benchmarking

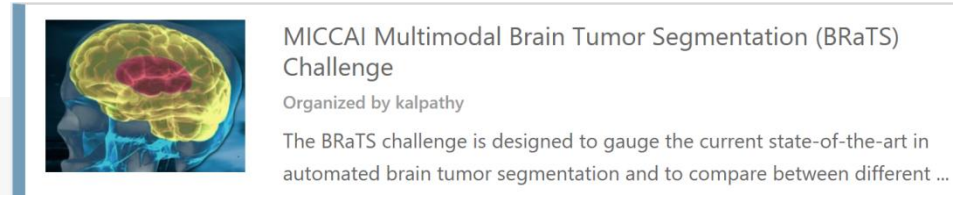
Establishing common measures

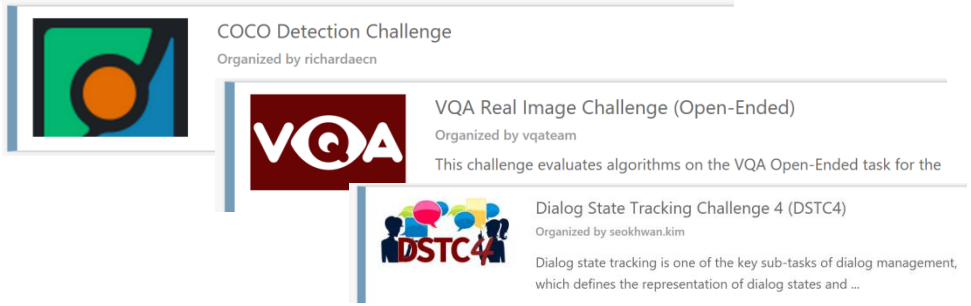
Coopetitions

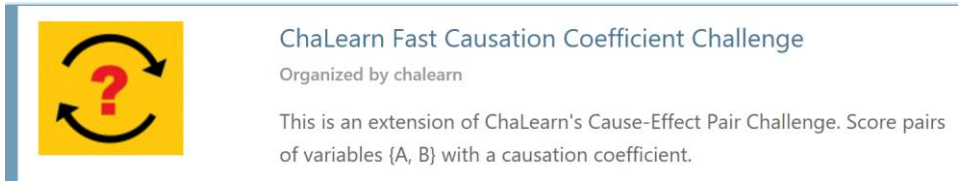
Solving challenges collaboratively

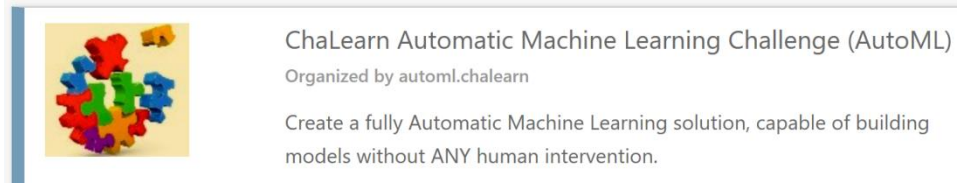
CodaLab ecosystem











2013 – CodaLab 1.0, an open source platform to accelerate reproducible computational research. Accepts result submission.

2014 – Expansion to CV, Speech

Accepts submission of code (test only, no training)

2015: Code submission (train and test) AutoML (blind testing). Hackathons. Coopetition.

2016: Expansion (CV, Speech, NLP, IR). Use in education.

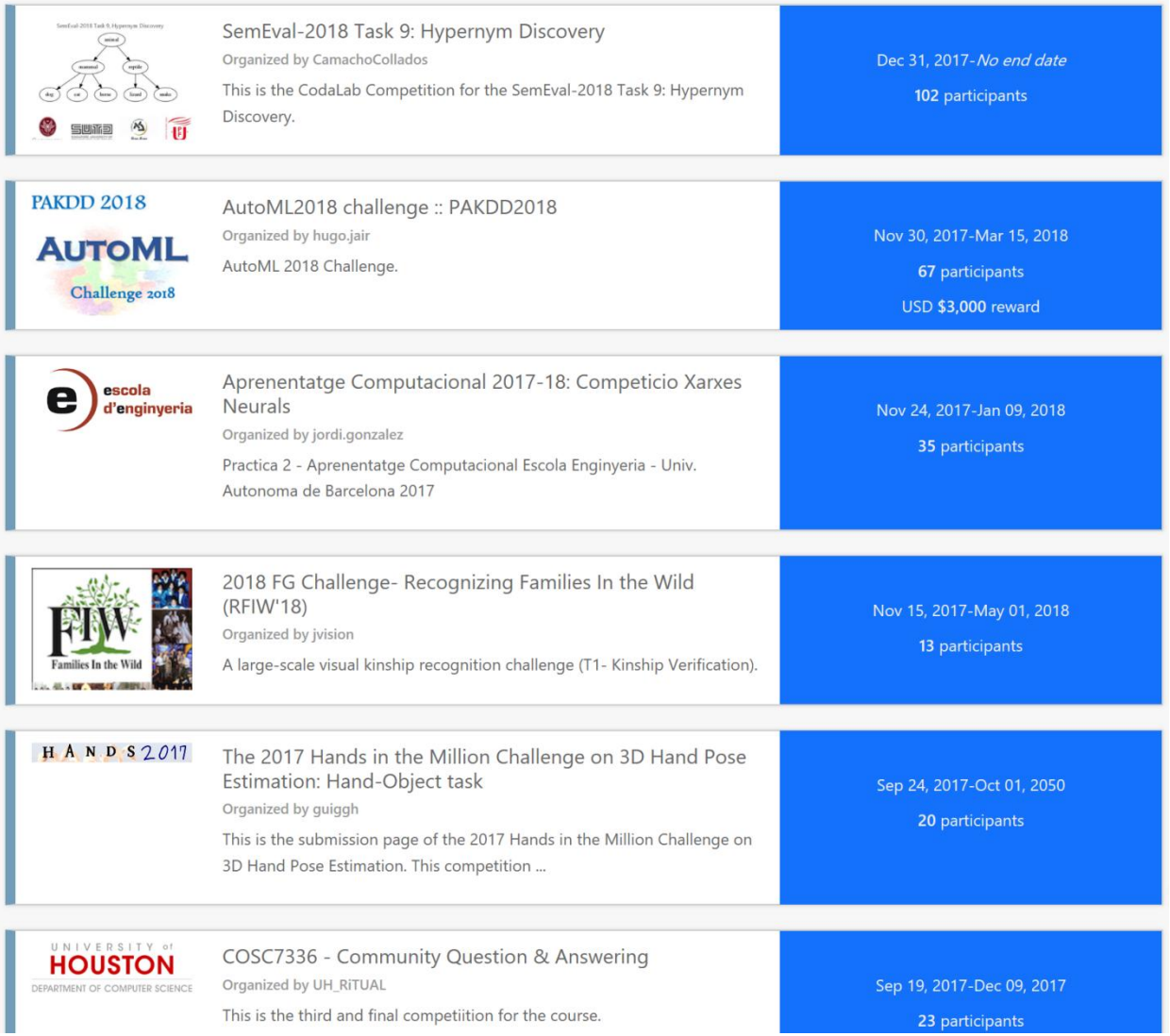
CodaLab 2017 and beyond

~ 480 challenges (145 public)

~ 10000 users

See http://www.chalearn.org/tips.html

for tips on how to organize a competition



Codalab v1.5

- **Lower barrier of entry with ChaLab**
- **Scalability & reusability**
- **Enables new types of competitions**

(e.g. Reinforcement Learning)

CodaLab

Open source: https://github.com/codalab/codalab-competitions
Public instance: https://competitions.codalab.org/
Local computer or cloud: Azure for research grant

Microsoft Azure

Users:

Code submission
http://automl.chalearn.org

Organizers:

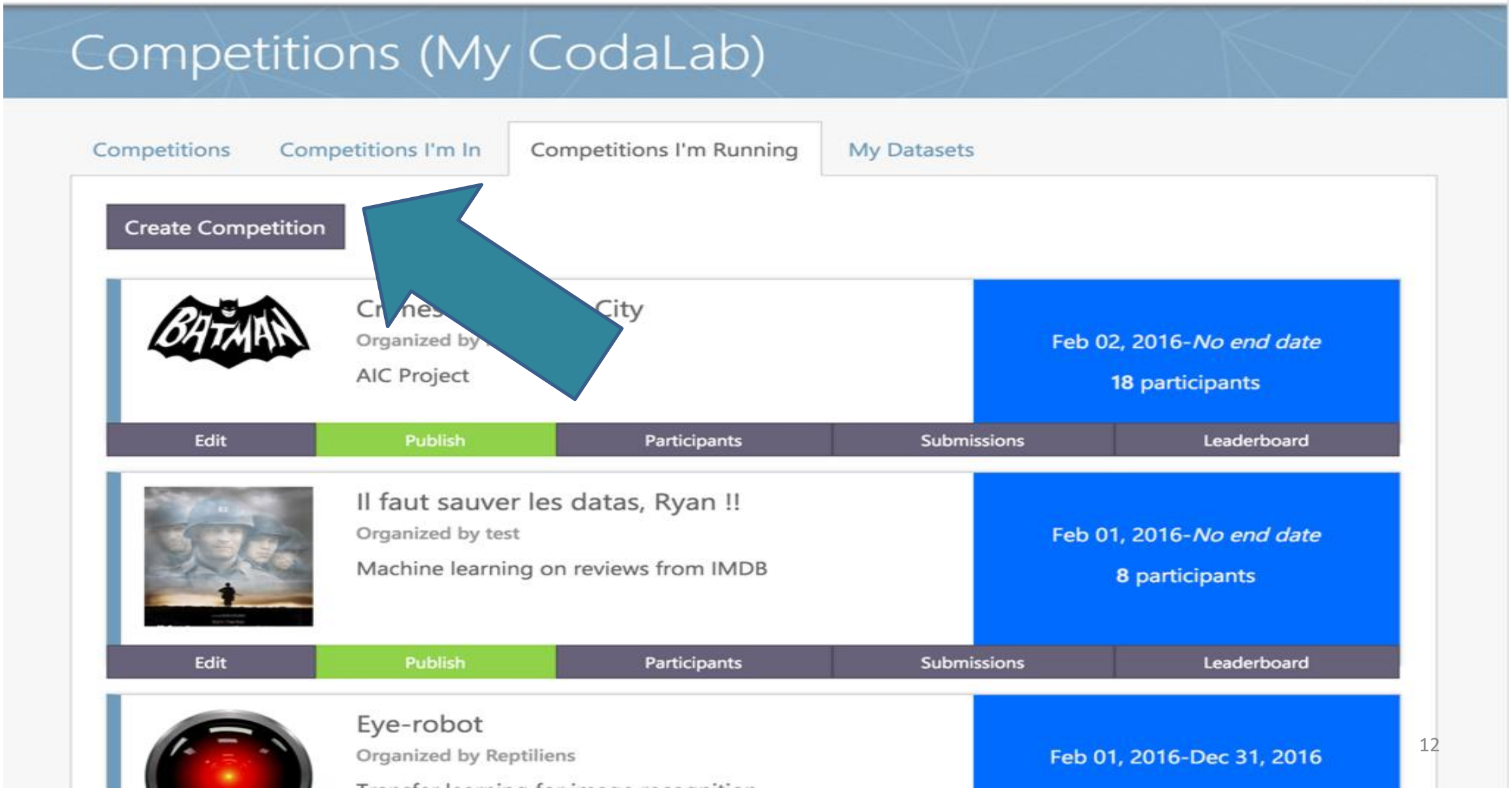
Competition bundles

Competition bundles

```yaml
title: Iris example challenge
description: Classify species of irises using sepal and petal length and width
image: iris.jpg

html:
  data: data.html
  evaluation: evaluation.html
  overview: overview.html
  terms: rules.html

phases:
  1:
    label: Development Phase
    description: 'Tune your models and submit prediction results.'
    start_date: 2017-08-26
    public_data: input_data_1_2.zip
    reference_data: reference_data_1.zip
    scoring_program: scoring_program_1_2.zip
    starting_kit: starting_kit.zip
  2:

leaderboard:
    leaderboards:
        Results: &RESULTS
            label: RESULTS
            rank: 1
    columns:
        bac_multiclass:
            leaderboard: *RESULTS
            label: Prediction score
            numeric_format: 4
            rank: 2
        Duration:
            leaderboard: *RESULTS
            label: Duration
            numeric_format: 2
            rank: 7
```

https://github.com/codalab/competition-examples

Upload bundle



TA DAH!

CodaLab My Competitions Help guyo

Competition

Admin features

Edit | Participants | Submissions

Iris

Secret url: https://competitions.codalab.org/competitions/15464?secret_key=986fce59-096a-4555-9319-a9f027894496

Organized by guyon - Current server time: Nov. 27, 2016, 9:01 p.m. UTC

Previous	▶ Current	End
Development	Final	Competition Ends
Nov. 19, 2016, 10:20 p.m. UTC	Nov. 22, 2016, 10:20 p.m. UTC	Never

Learn the Details | Phases | Participate | Results | Public Submissions | Forums

- Overview
- Evaluation
- Terms and Conditions

Iris

Brought to you by ChaLearn

The famous Iris classification problem of Sir Ronald Fisher

This challenge was generated using chalab.

Admin functions

CodaLab

My Competitions

Edit | Participants | Submissions | Dumps

Iris

Secret url: https://codalab.lri.fr/competitions/76?secret_key=6995bf8c-f3ee-428c-b318-084eb484ca10

Organized by Div_Kal - Current server time: Nov. 12, 2017, 9:29 a.m. UTC

▶ Current	Next
Development	Final
Oct. 22, 2017, 6:53 p.m. UTC	April 30, 2018, 6:53 p.m. UTC

Learn the Details | Phases | Participate | Results | Public Submissions | Forums

Development | Final

Phase description

Development phase: create models and submit them or directly submit results on validation and/or test data; feed-back are provided on the validation set only.

Max submissions per day: 5

Max submissions total: 100

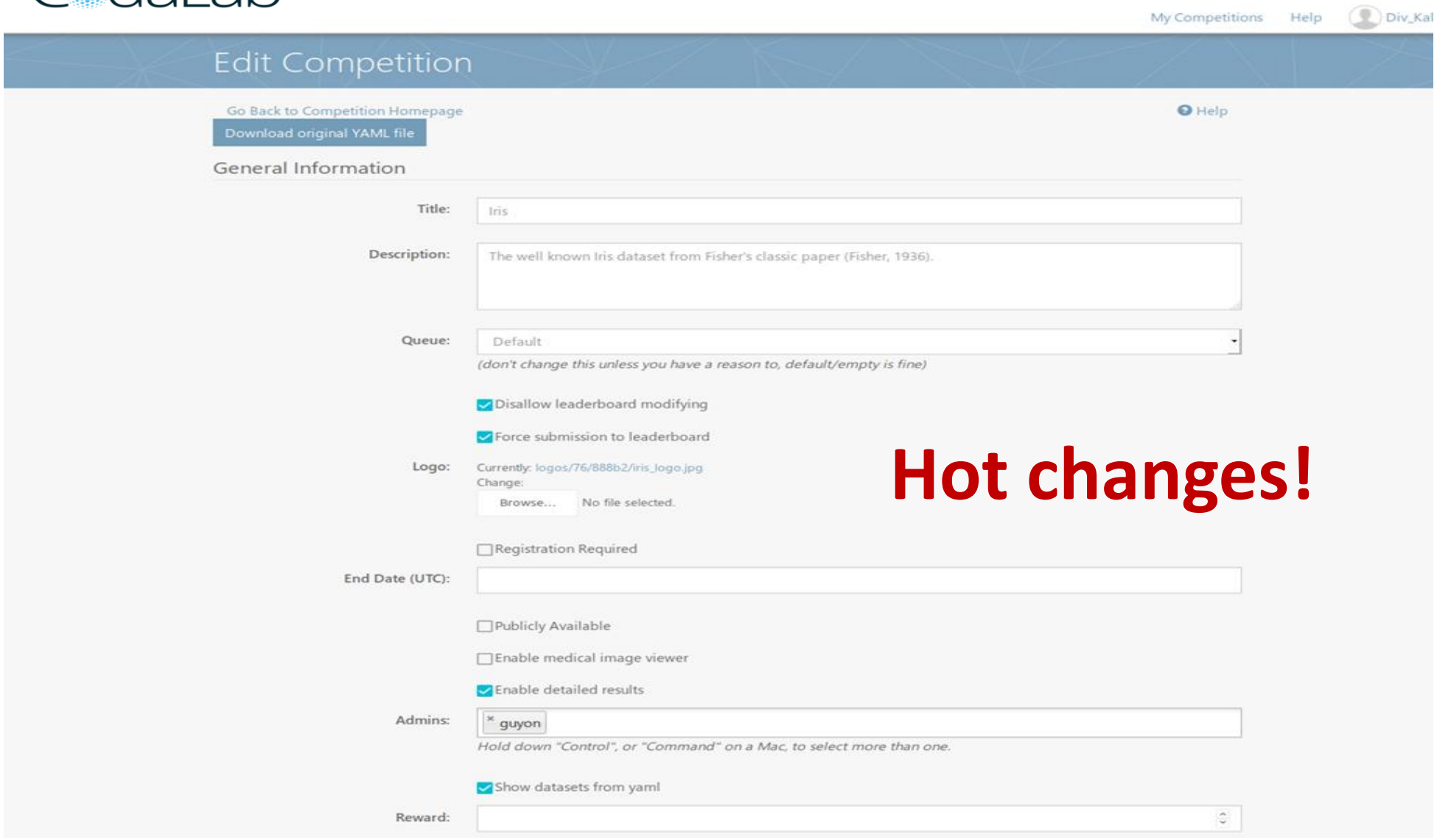
Download CSV | Download all submissions on leaderboard

Results

#	User	Entries	Date of Last Entry	Prediction score ▲	Duration ▲	Detailed Results
1	Div_Kal	4	11/12/17	-1.0000 (1)	0.00 (1)	View

Editor

CodaLab



Hot changes!

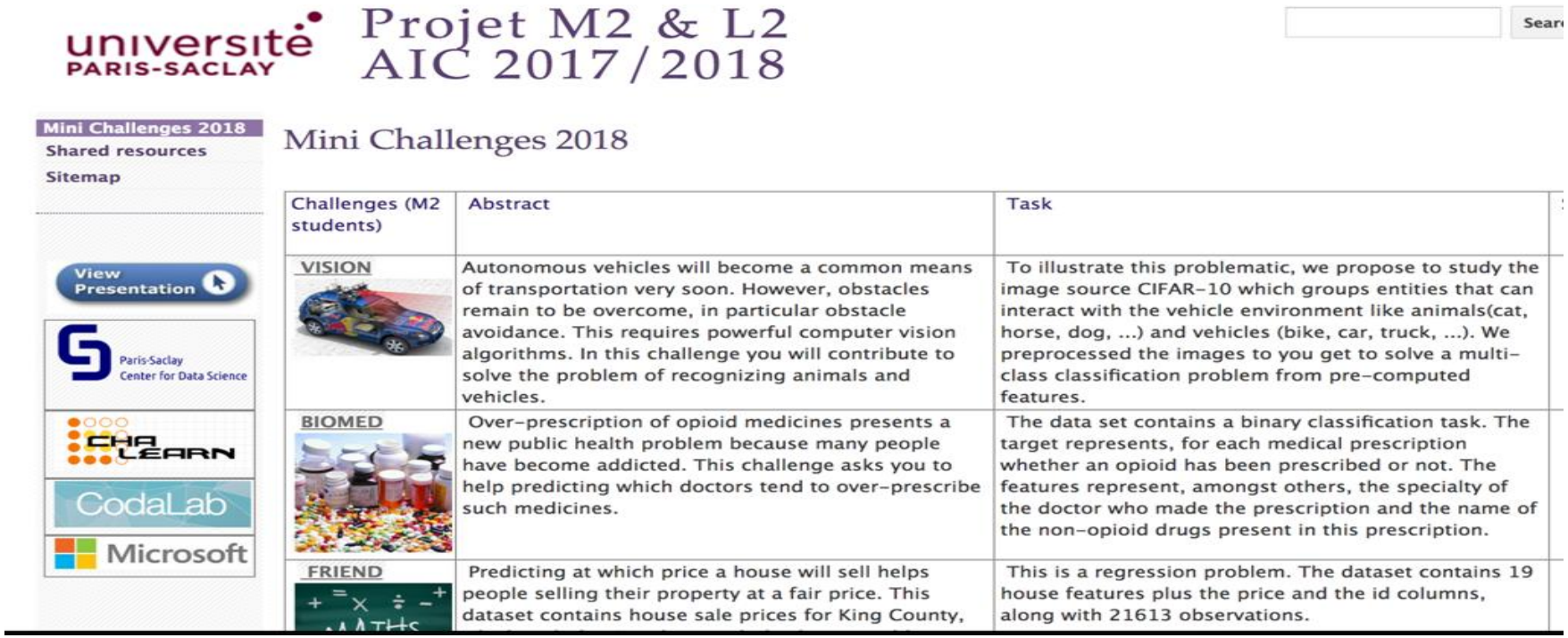
CodaLab V1.5

- **Wizard: ChaLab (beta)** https://chalab.lri.fr
- **Dumps**
- **Personal compute workers**
- **Dockers**
- **Ingestion program**

Documentation on Wiki https://github.com/codalab/codalab-competitions/wiki/
[DOC-URL]

Student challenges

https://sites.google.com/a/chalearn.org/saclay/



université PARIS-SACLAY

Projet M2 & L2
AIC 2017/2018

Mini Challenges 2018
Shared resources
Sitemap

View Presentation

Paris-Saclay Center for Data Science

CHALEARN

CodaLab

Microsoft

Mini Challenges 2018

Challenges (M2 students)	Abstract	Task
VISION	Autonomous vehicles will become a common means of transportation very soon. However, obstacles remain to be overcome, in particular obstacle avoidance. This requires powerful computer vision algorithms. In this challenge you will contribute to solve the problem of recognizing animals and vehicles.	To illustrate this problematic, we propose to study the image source CIFAR-10 which groups entities that can interact with the vehicle environment like animals(cat, horse, dog, ...) and vehicles (bike, car, truck, ...). We preprocessed the images to you get to solve a multi-class classification problem from pre-computed features.
BIOMED	Over-prescription of opioid medicines presents a new public health problem because many people have become addicted. This challenge asks you to help predicting which doctors tend to over-prescribe such medicines.	The data set contains a binary classification task. The target represents, for each medical prescription whether an opioid has been prescribed or not. The features represent, amongst others, the specialty of the doctor who made the prescription and the name of the non-opioid drugs present in this prescription.
FRIEND	Predicting at which price a house will sell helps people selling their property at a fair price. This dataset contains house sale prices for King County,	This is a regression problem. The dataset contains 19 house features plus the price and the id columns, along with 21613 observations.

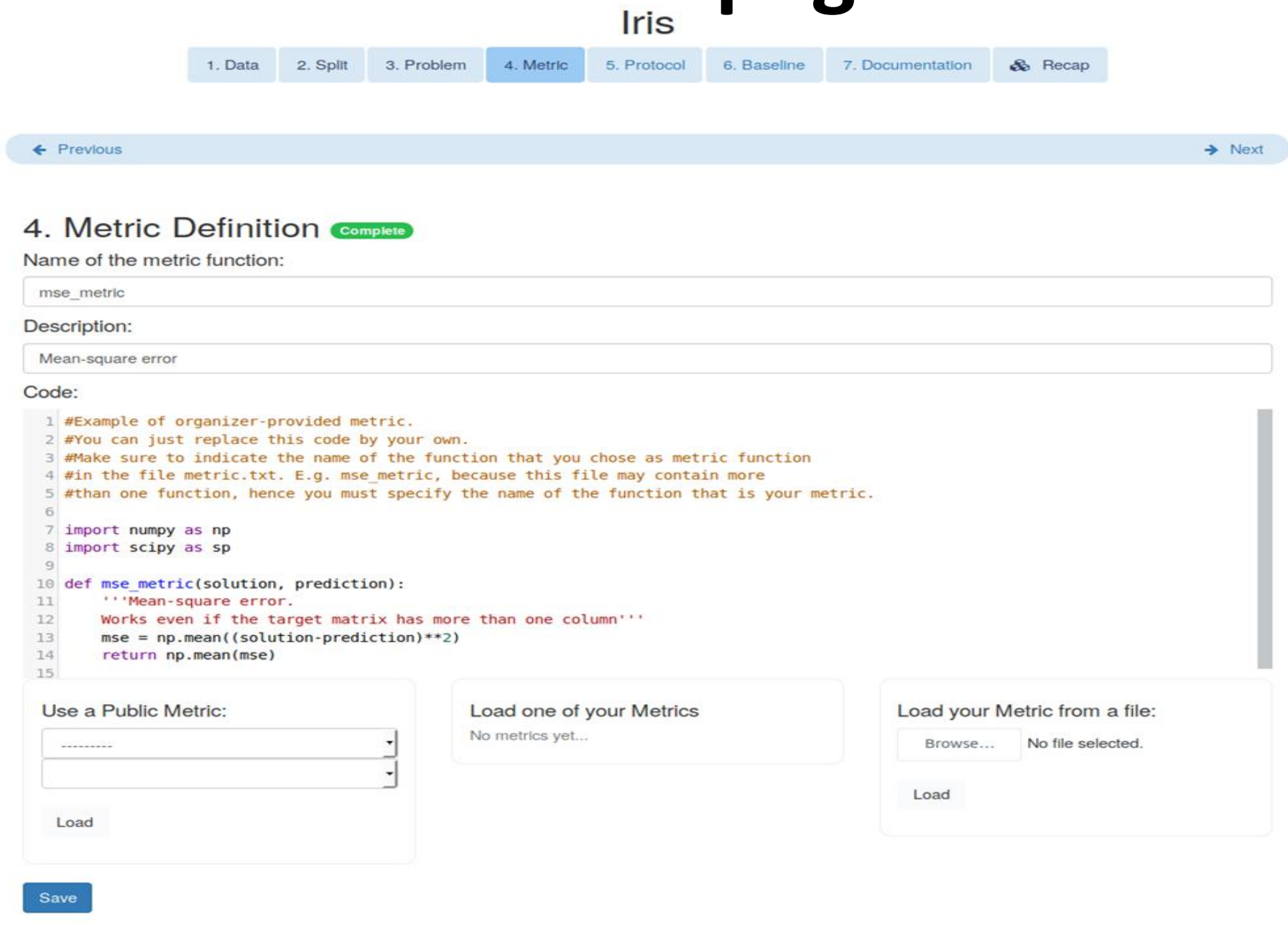
Easy, but not stronger than its weakest link

Data Task Metrics Protocol Baseline Doc Rules Platform Testing Publicity

http://chalab.lri.fr/


Chalab (beta)
Machine Learning Challenges Creator
Home
Profile
Groups
Logout
Iris
From group : M2AIC
Organized by ChaLearn
The well known Iris dataset from Fisher's classic paper (Fisher, 1936).
Edit
Created: Nov. 12, 2017, 12:31 a.m.
Last change: Nov. 12, 2017, 12:36 a.m.
Challenge Definition:
1. Data
Define your d
2. Split
Define how to split data.
3. Problem
Define the ingestion program.

Metric page


Iris
1. Data
2. Split
3. Problem
4. Metric
5. Protocol
6. Baseline
7. Documentation
Recap
Previous
Next
4. Metric Definition
Complete
Name of the metric function:
mse_metric
Description:
Mean-square error
Code:
#Example of organizer-provided metric.
#You can just replace this code by your own.
#Make sure to indicate the name of the function that you chose as metric function
#in the file metric.txt. E.g. mse_metric, because this file may contain more
#than one function, hence you must specify the name of the function that is your metric.
import numpy as np
import scipy as sp
def mse_metric(solution, prediction):
'''Mean-square error.
Works even if the target matrix has more than one column'''
mse = np.mean((solution-prediction)**2)
return np.mean(mse)
Use a Public Metric:

Load
Load one of your Metrics
No metrics yet...
Load your Metric from a file:
Browse...
No file selected.
Load
Save

Iris

Edit

Created: Nov. 12, 2017, 12:31 a.m.

Last change: Nov. 12, 2017, 12:50 a.m.

From group : M2AIC

Organized by ChaLearn

The well known Iris dataset from Fisher's classic paper (Fisher, 1936).

Challenge Definition:

1. Data
Define your data set.

2. Split
Define how to split data.

3. Problem
Define the ingestion program.

4. Metric
Define the metrics.

5. Protocol
Define the protocol.

6. Baseline
Define the baseline.

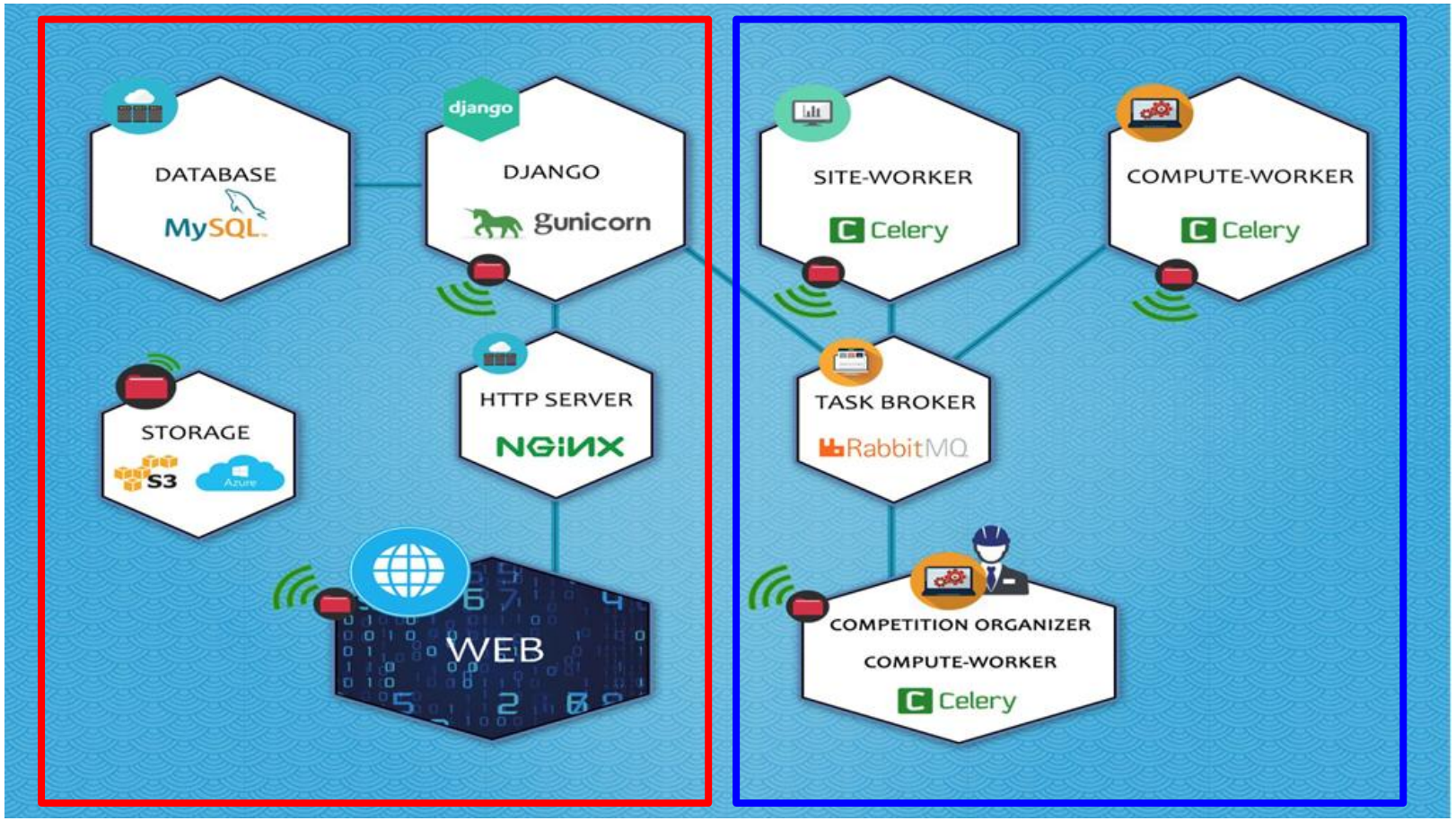
7. Documentation
Document your challenge.

Package & Publish
Package & Publish your challenge.

Compile bundle

Your own compute workers

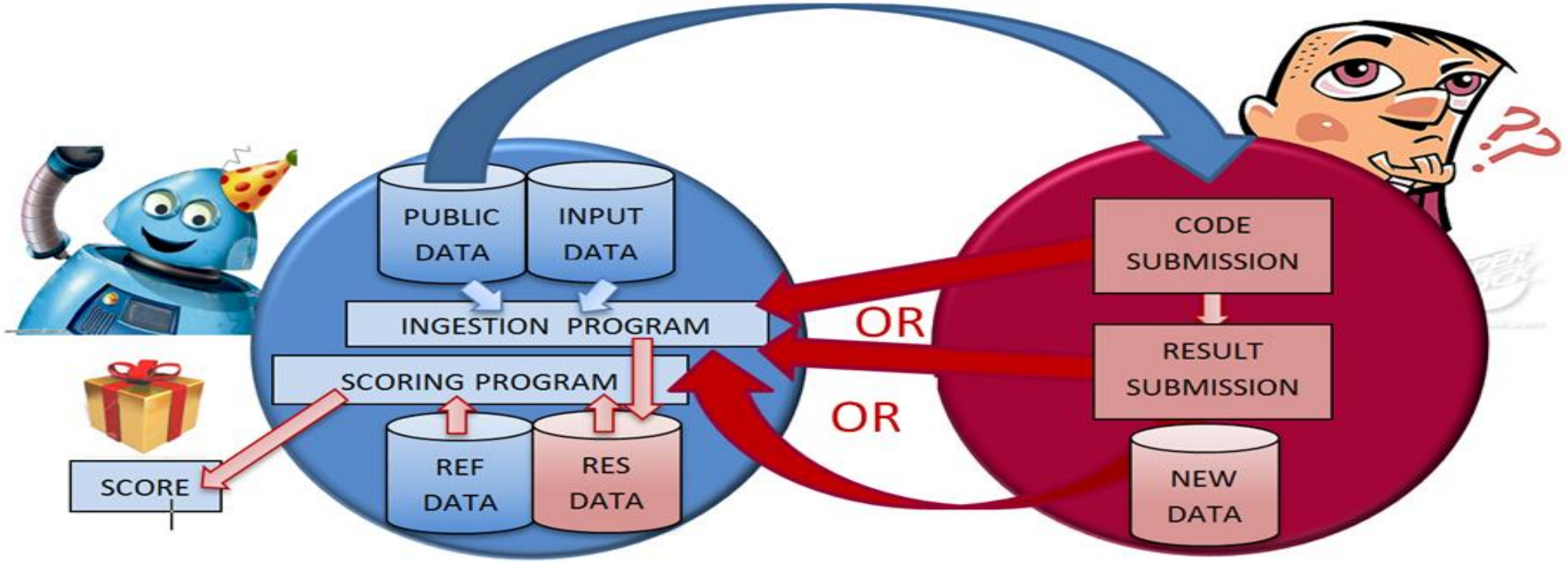
Front end



Back end

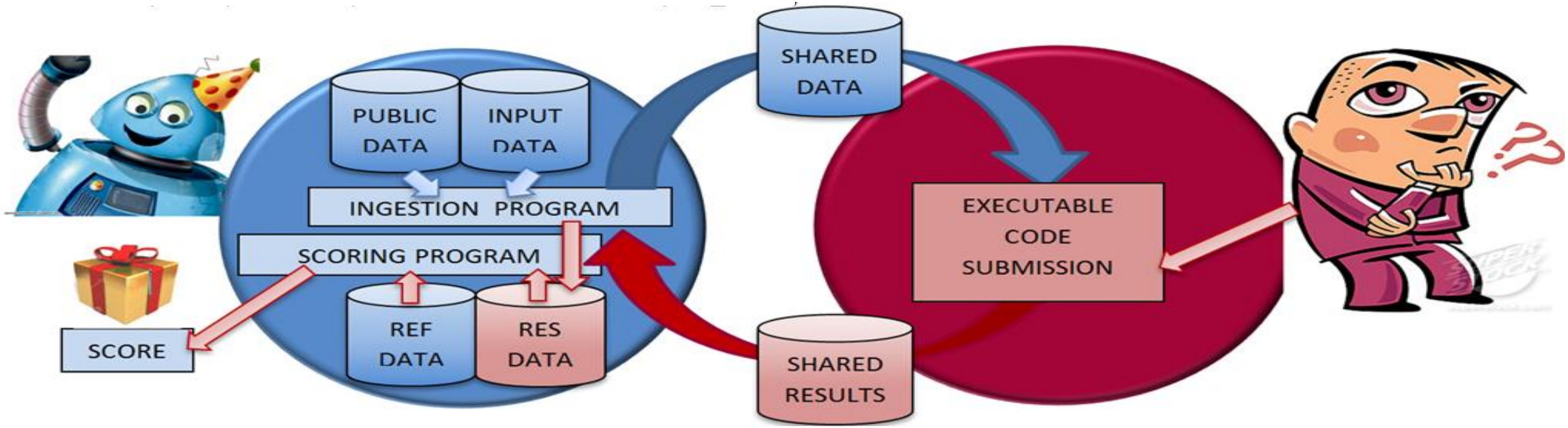
[DOC-URL]/User_Using-your-own-compute-workers

Ingestion program



[DOC-URL]/User_Building-an-Ingestion-Program-for-a-Competition

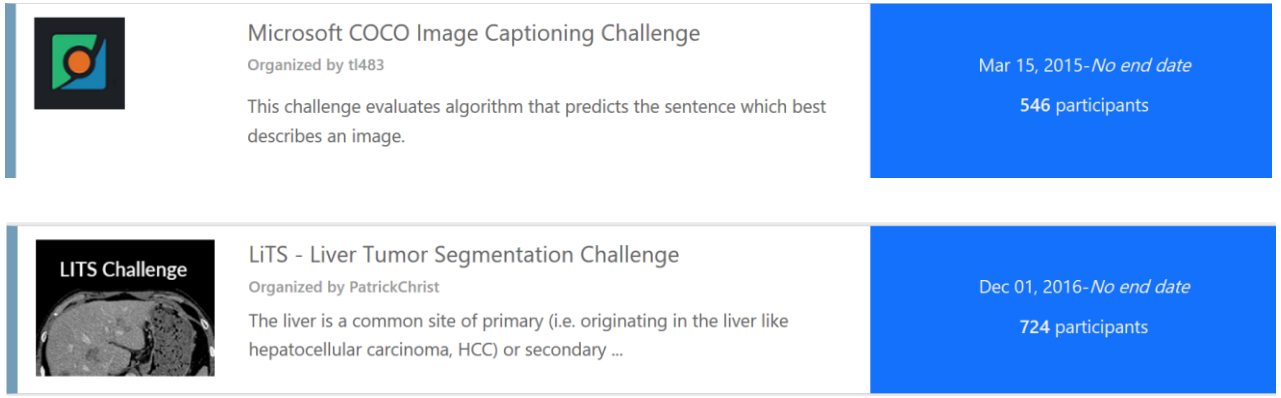
Interactive tasks (e.g. RL)

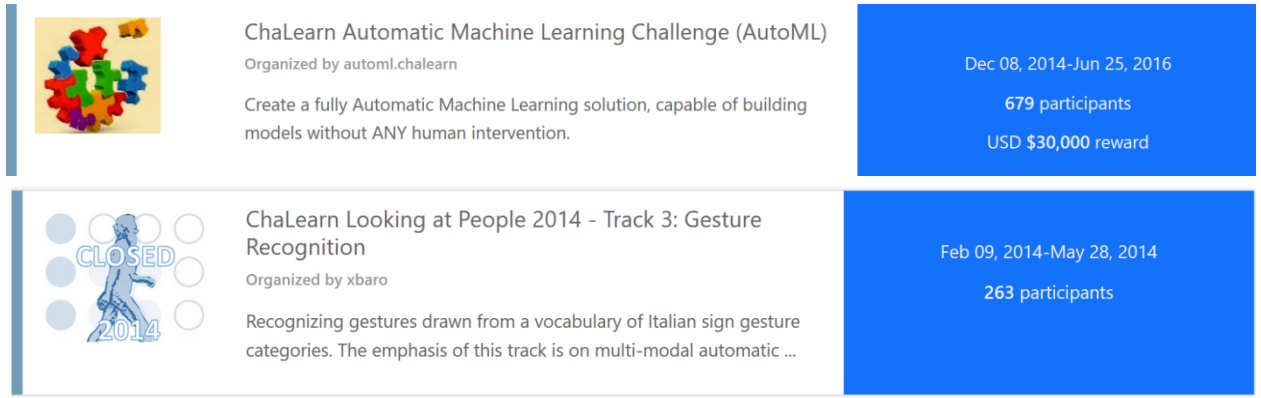


[DOC-URL]/User_Building-an-Ingestion-Program-for-a-Competition

Codalab competitions

~150 public competitions during last 4 years



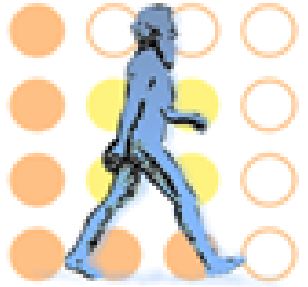


- ChaLearn is a non-profit organization focusing on challenges organization in Machine Learning

CHA LEARN

http://chalearn.org

- ChaLearn Looking at People (ChaLearn LAP) is a branch of ChaLearn focusing on *Human Analysis.*

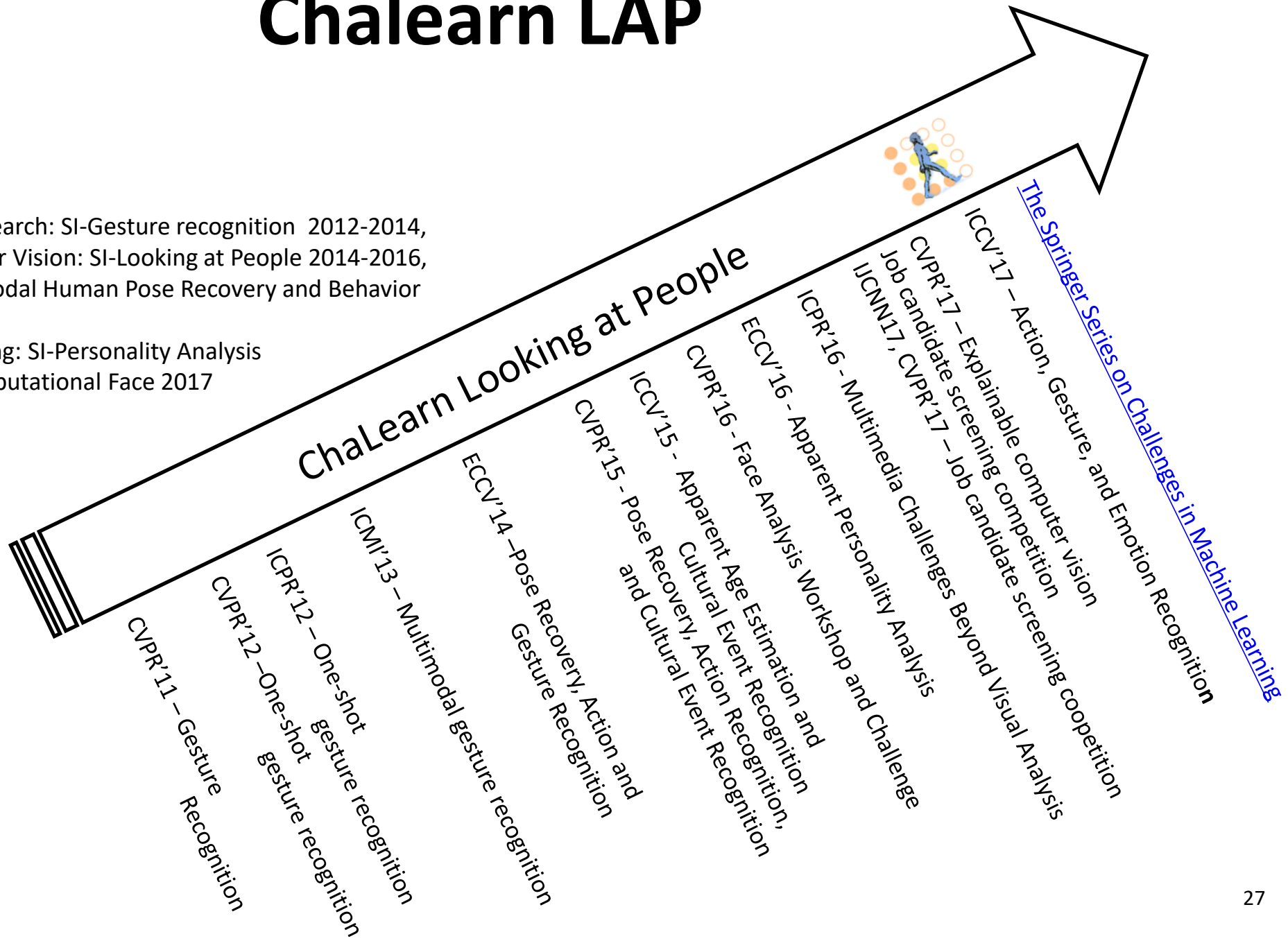


http://chalearnlap.cvc.uab.es/

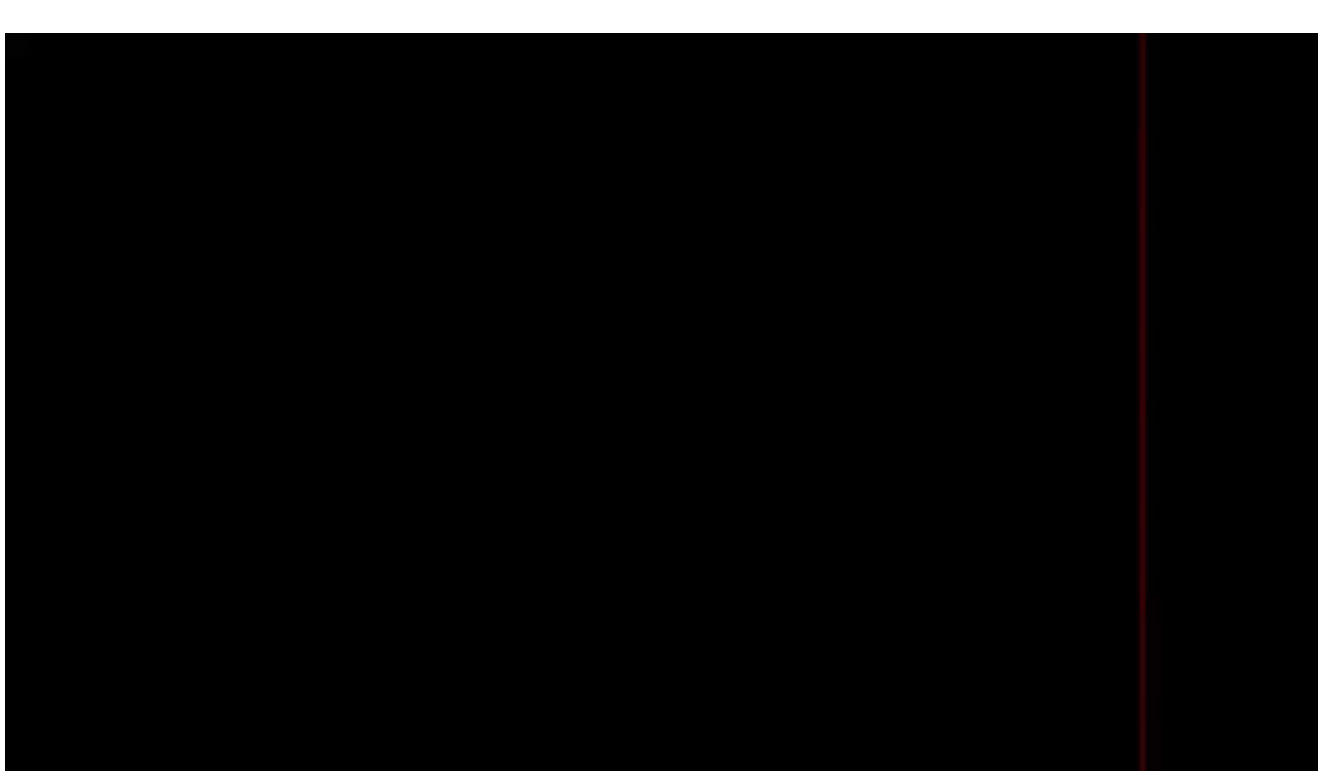
Chalearn LAP

Associated special issues:

- Journal of Machine Learning Research: SI-Gesture recognition 2012-2014,
- International Journal of Computer Vision: SI-Looking at People 2014-2016,
- IEEE Trans. on PAMI: SI-Multi-modal Human Pose Recovery and Behavior 2016-2017
- IEEE Trans. on Affective Computing: SI-Personality Analysis
- IEEE Trans. on PAMI: SI-The Computational Face 2017



Chalearn LAP – Montalbano multimodal gesture recognigion



- ✓ ECCV'14 –Pose Recovery, Action and Gesture Recognition
- ✓ ICMI'13 – Multimodal gesture recognition
- ✓ ICPR'12 – One-shot gesture recognition
- ✓ CVPR'12 –One-shot gesture recognition
- ✓ CVPR'11 – Gesture Recognition

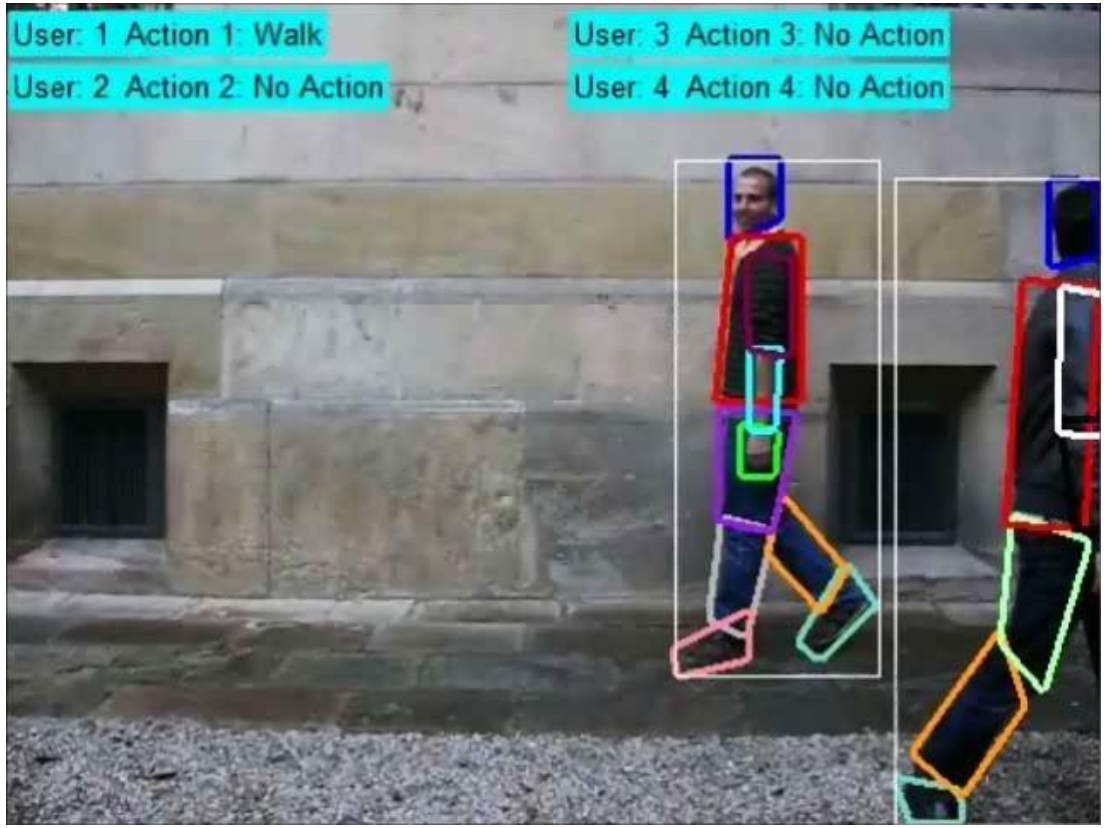
- +14,000 gestures,
- 20 Italian sign gesture categories,
- RGB, depth, audio, subject mask and skeleton information,
- ~1.7M manually labeled frames

ChaLearn Looking at People

•Sergio Escalera, Jordi Gonzàlez, Xavier Baró, Miguel Reyes, Oscar Lopés, Isabelle Guyon, Vassilis Athitsos, Hugo J. Escalante, Multi-modal Gesture Recognition Challenge 2013: Dataset and Results, Chalearn Multi-Modal Gesture Recognition Workshop, International Conference on Multimodal Interaction, ICMI, 2013.
•Sergio Escalera, Xavier Baro, Jordi Gonzalez, Miguel A. Bautista, Meysam Madadi, Miguel Reyes, Víctor Ponce, Hugo J. Escalante, Jamie Shotton, Isabelle Guyon, ChaLearn Looking at People Challenge 2014: Dataset and Results, ChaLearn Looking at People, European Conference on Computer Vision, 2014.

Chalearn LAP – Action, interaction and poses

ChaLearn Looking at People



✓ ECCV'14 –Pose Recovery, Action and Gesture Recognition

- 7 action categories,
- 4 interaction categories,
- RGB, pose and pixel labeling precision information,
- ~8K labeled frames,
- 14 limb labels.

•Sergio Escalera, Xavier Baro, Jordi Gonzalez, Miguel A. Bautista, Meysam Madadi, Miguel Reyes, Víctor Ponce, Hugo J. Escalante, Jamie Shotton, Isabelle Guyon, ChaLearn Looking at People Challenge 2014: Dataset and Results, ChaLearn Looking at People, European Conference on Computer Vision, 2014.

•D. Sánchez, and J.C. Ortega, and M.A. Bautista, Human Body Segmentation with Multi-limb Error-Correcting Output Codes Detection and Graph Cuts Optimization, 6th Iberian Conference on Pattern Recognition and Image Analysis, IBPRIA, Madeira, Portugal, 2013. Selected paper for Neurocomputing.

Chalearn LAP – Cultural event recognition

ChaLearn Looking at People

- ✓ ICCV'15 - Apparent Age Estimation and Cultural Event Recognition
- ✓ CVPR'15 - Pose Recovery, Action Recognition, and Cultural Event Recognition

- 100 cultural events,
- +27 countries around the world,
- 28K labeled RGB data.

•Sergio Escalera, Junior Fabian, Pablo Pardo, Xavier Baro, Jordi Gonzalez, Hugo Escalante, Dusan Misevic, Ulrich Steiner, Isabelle Guyon, ChaLearn Looking at People 2015: Apparent Age and Cultural Event Recognition datasets and results, ChaLearn Looking at People workshop, ICCV, 2015.

•Xavier Baro, Jordi Gonzalez, Junior Fabian, Miguel A. Bautista, Marc Oliu, Hugo J. Escalante, Isabelle Guyon, Sergio Escalera, ChaLearn Looking at People 2015 challenges: action spotting and cultural event recognition, CVPR workshops, 2015.

Chalearn LAP – Apparent age estimation

ChaLearn Looking at People

- ✓ CVPR'16 - Face Analysis Workshop and Challenge
- ✓ ICCV'15 - Apparent Age Estimation and Cultural Event Recognition

- 8K images each displaying an individual,
- Labels consisting of,
  - Real and apparent age,
  - Gender,
  - Smile/no-smile,
  - Wearing accessories.

•Eirikur Agustsson, Radu Timofte, Sergio Escalera, Xavier Baro, Isabelle Guyon, Rasmus Rothe, Apparent and real age estimation in still images with deep residual regressors on APPA-REAL database, FG, 2017. **FG 2017 one of the best papers award**

•Sergio Escalera, Junior Fabian, Pablo Pardo, Xavier Baro, Jordi Gonzalez, Hugo Escalante, Dusan Misevic, Ulrich Steiner, Isabelle Guyon, ChaLearn Looking at People 2015: Apparent Age and Cultural Event Recognition datasets and results, ChaLearn Looking at People workshop, ICCV, 2015.

Chalearn LAP – Faces of the world: accessories and gender recognition

ChaLearn Looking at People

- ✓ CVPR'16 - Face Analysis Workshop and Challenge
- 25,000 images collected from flickr

Accessory	Train	Validation	Test
Hat	1151	608	869
Headband	243	109	193
Glasses	1232	614	828
Earrings	770	389	592
Necklace	615	300	559
Tie	151	72	220
Scarf	256	137	256

Attribute	Train	Validation	Test
Male	2946	1691	4614
Female	3318	1361	3799
Smile	2234	1969	4411
No Smile	3937	1117	3849

- Sergio Escalera, Mercedes Torres-Torres, Brais Martinez, Xavier Baró, Hugo Jair Escalante, Isabelle Guyon, Georgios Tzimiropoulos, Ciprian Corneou, Marc Oliu Simón, Mohammad Ali Bagheri, Michel Valstar, ChaLearn Looking at People and Faces of the World: Face AnalysisWorkshop and Challenge 2016, CVPRW, CVPR, 2016.

Chalearn LAP – Apparent personality

ChaLearn Looking at People

NIPS 2016 Demo

- ✓ CVPR'17 – Explainable computer vision and Job candidate screening competition
- ✓ IJCNN17, CVPR'17 – Job candidate screening coopetition
- ✓ ICPR'16 - Multimedia Challenges Beyond Visual Analysis
- ✓ ECCV'16 - Apparent Personality Analysis

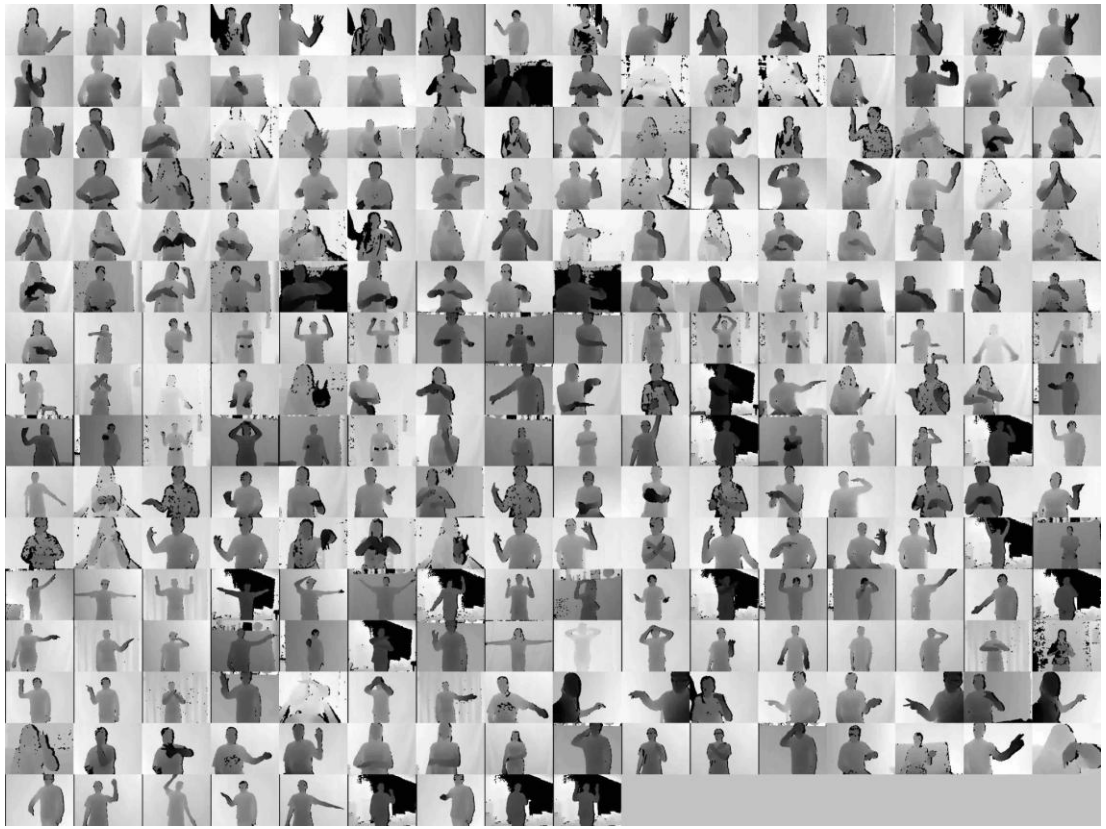
- +10K 15s video,
- Big **five** personality traits,
- Video transcription.

•Víctor Ponce-López, Baiyu Chen, Marc Oliu, Ciprian Corneanu, Albert Clapés, Isabelle Guyon, Xavier Baró, Hugo Jair Escalante, Sergio Escalera, ChaLearn LAP 2016: First Round Challenge on First Impressions – Dataset and Results, ChaLearn Apparent Personality Analysis workshop, ECCV, 2016.

Chalearn LAP – Sign gesture recognition

ChaLearn Looking at People

- ✓ ICCV 2017

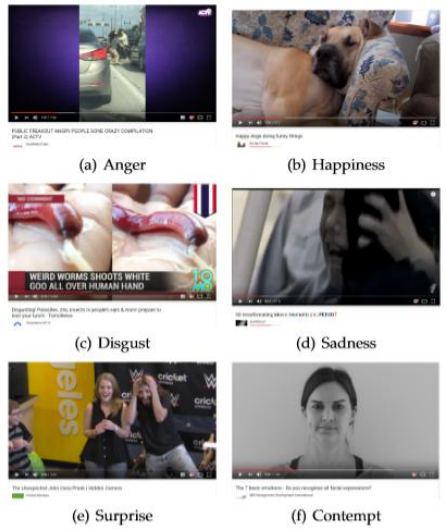


Chalearn LAP – Real-fake emotion recognition

ChaLearn Looking at People

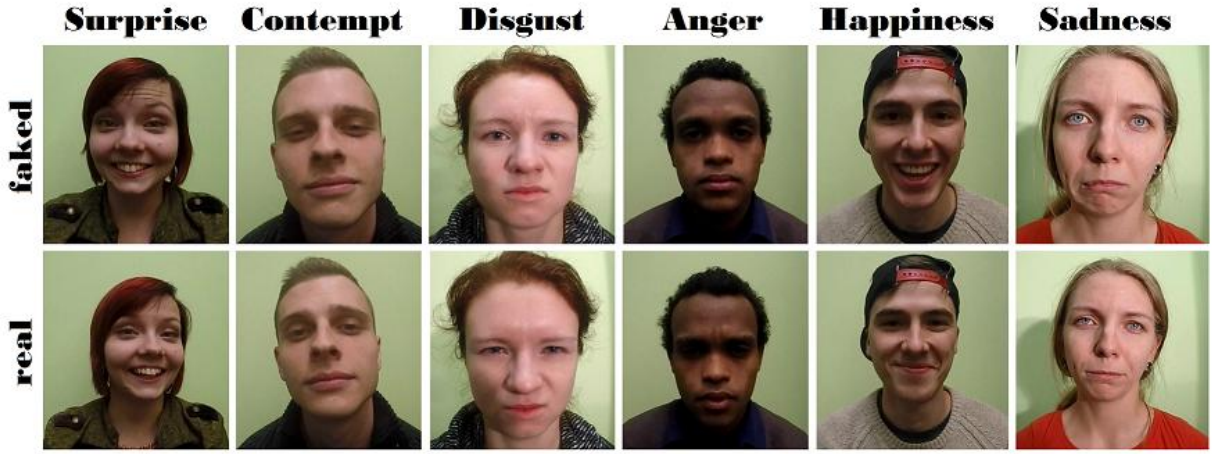
✓ ICCV 2017

- Recognition of fakeness of an emotion
- Recognition of fake/true specific emotion
- 6 basic emotions
- 100FPS



- **SASE-FE Dataset**

Sets	# Labels	# Videos	# Performers
Training	12	480	40
Validation	12	60	5
Test	12	60	5
Total	**12**	**600**	**50**



Springer series on Challenges in Machine Learning

- http://www.springer.com/series/15602

The books of this innovative series collect papers written by successful competitions in machine learning. They also include analyses of the challenges, tutorial material, dataset descriptions, and pointers to data and software. Together with the websites of the challenge competitions, they offer a complete teaching toolkit and a valuable resource for engineers and scientists.

Book: First NIPS '17 Competition

- Competitions volume chapter submission 15th January, 2018
- Book chapter acceptance notification 15th March, 2018
- Camera ready submission 15th April, 2018
- Tentative publication of the book 1st July, 2018

Info: sergio.escalera.guerrero@gmail.com

https://cmt3.research.microsoft.com/User/Login?ReturnUrl=%2FCTSP2017%2FSubmission%2FManage

ChaLearn Looking at People

http://chalearnlap.cvc.uab.es/

IJCNN and ECCV 2018 Inpainting and caption removal competition and workshop (pending acceptance)

Inpainting of human parts in still images

Removing captions from videos

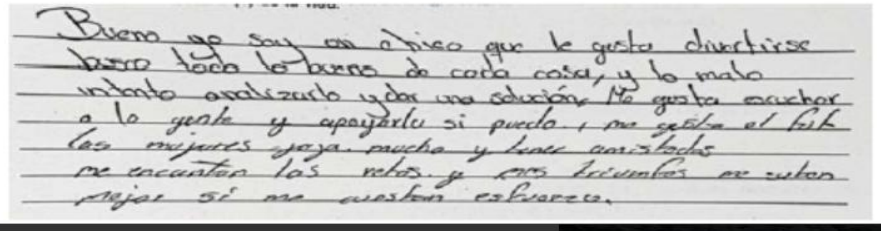
IEEE WORLD CONGRESS ON COMPUTATIONAL INTELLIGENCE
8-13 July 2018, Rio de Janeiro, Brazil

ECCV 2018
European Conference on Computer Vision
8 – 14 September 2018 | Munich, Germany

ICPR 2018 Multimedia Information Processing for Personality and Social Networks Analysis contest and workshop (pending acceptance) by ChaLearn Looking At People, MediaEval, and ImageCLEF

IAPR ICPR 2018
INTERNATIONAL CONFERENCE ON PATTERN RECOGNITION

Handwritten texts for Personality Identification



Information fusion for social image retrieval and diversification

Hundreds of Flickr image query results (>500 queries) with: images, social metadata (e.g., description, number of comments, tags, etc.), descriptors for visual, text, social information (e.g. user tagging credibility), deep learning features, expert annotations for image relevance and diversification (i.e. clustering of images according to the similarity of their content).

Thank you!

If you want to use codalab and need support, or you want to propose a challenge being sponsored by ChaLearn please contact us!

admin@chalearn.org

ChaLearn Looking at People

http://chalearnlap.cvc.uab.es/

Codalab

Open source: https://github.com/codalab/codalab-competitions

Public instance: https://competitions.codalab.org/