ChaLearn Looking at People 2015 new competitions: Age Estimation and Cultural Event Recognition

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The International Joint Conference on Neural Networks

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- Ongoing and upcoming events

ChaLearn events

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ChaLearn Gesture Recognition Challenges and Workshops

CVPR 2011 - Workshop and Challenge on Gesture Recognition

CVPR 2012 - Workshop and Challenge on Gesture Recognition

ICPR 2012 - Workshop and Challenge on Gesture Recognition

- **Quantitative competition:**
- One-shot learning
- New depth-rgb data set
- Dictionaries among 5-8 gesture categories
- Leveinstein: recognizing list of sequences within each sequence

ICMI 2013 - Workshop and Challenge on Gesture Recognition

ECCV 2014 – Workshop and Challenge on Human Pose, Action and Gesture Recognition

- **Quantitative competition:**
- User independent multiple instance learning
- New depth-rgb-mask-skeleton-audio data set
- Dictionary of 20 gesture categories
- Leveinstein: recognizing list of gestures within each sequence

ChaLearn events

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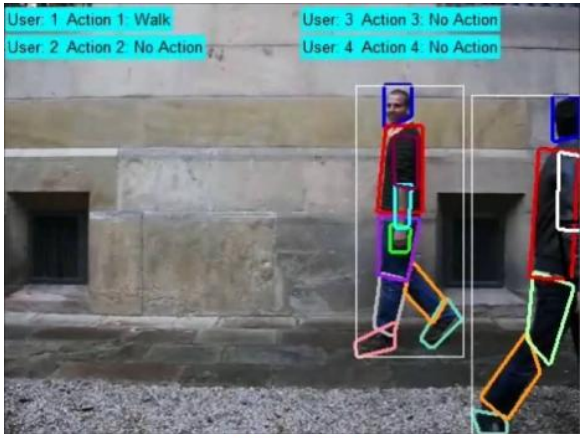
ECCV 2014 – Workshop and Challenge on Human Pose, Action and Gesture Recognition



CVPR 2015- ChaLearn Looking at People 2015 - Action spotting and **cultural event recognition**

ICCV 2015- ChaLearn Looking at People 2015 - **Age recognition and extended cultural event recognition**

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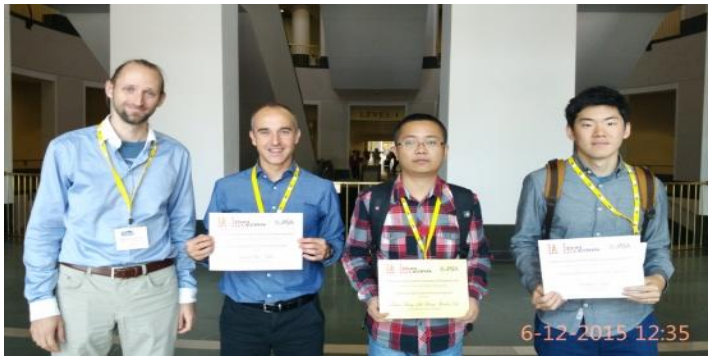
Winners and Invited speakers

ICMI 2013 winners

ECCV 2014 winners



CVPR 2015 winners

Invited speakers: Antonis Argyros, Takeo Kanade, Deva Ramanan, Stan Sclaroff, Cordelia Schmid, Fernando de la Torre, Jeffrey Cohn, Tinne Tuytellars, Leonid Sigal, Larry Davis, among others. Special issues: **JMLR, TPAMI, (IJCV LaP opened until february 2016)**

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Challenge on cultural event recognition

•**<u>Track on Cultural Event Recognition</u>:** More than 10,000 images corresponding to 50 different cultural event categories will be considered. Examples of cultural events will be Carnival (Brasil, Italy, USA), Oktoberfest (Germany), San Fermin (Spain), Maha-Kumbh-Mela (India) and Aoi-Matsuri (Japan), among others.

Cultural event

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•**Track on Cultural Event Recognition:** More than 10,000 images corresponding to 50 different cultural event categories will be considered.

Dataset	#Images	#Classes	Year
Action Classification Dataset [8]	5,023	10	2010
Social Event Dataset [11]	160,000	149	2012
Event Identification Dataset [1]	594,000	24,900	2010
Cultural Event Dataset	11,776	50	2015

- **First dataset** on cultural events
- **10.000 images** corresponding to **50 cultural events**.
- **Person related** events.
- High intra and low inter-class variability.
- **Different cues** can be exploited like garments, human poses, crowds analysis, objects and background scene.

Cultural event

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•**Track on Cultural Event Recognition:** More than 10,000 images corresponding to 50 different cultural event categories will be considered.

Inter-class variability

Cultural event

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•**Track on Cultural Event Recognition:** More than 10,000 images corresponding to 50 different cultural event categories will be considered.

Inter-class variability

Carnival of Dunkerque

Carnival of Rio

Carnival of Venice

Carnival of Helsinki

Nothing Hill Carnival

Carnival of Quebec

Cultural event

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•**Track on Cultural Event Recognition:** More than 10,000 images corresponding to 50 different cultural event categories will be considered.

Inter-class variability

Quebec Winter Carnival

Harbin Ice and Snow Festival

Average Precision evaluation

For each image, participants submit their confidence for all the categories (Average Precision).

Cultural event

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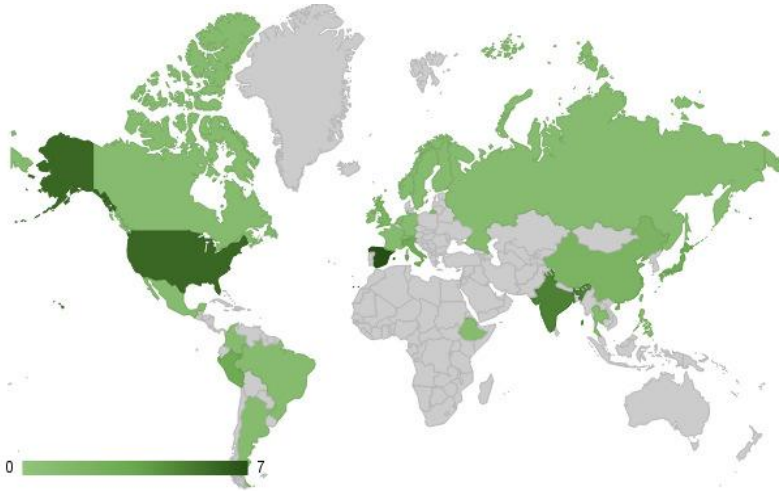
•**Track on Cultural Event Recognition:** More than 10,000 images corresponding to 50 different cultural event categories will be considered.

Cultural Event	Country	#Images
1. Annual Buffalo Roundup	USA	334
2. Ati-atihan	Philippines	357
3. Ballon Fiesta	USA	382
4. Basel Fasnacht	Switzerland	310
5. Boston Marathon	USA	271
6. Bud Billiken	USA	335
7. Buenos Aires Tango Festival	Argentina	261
8. Carnival of Dunkerque	France	389
9. Carnival of Venice	Italy	455
10. Carnival of Rio	Brazil	419
11. Castellers	Spain	536
12. Chinese New Year	China	296
13. Correfocs	Catalonia	551
14. Desert Festival of Jaisalmer	India	298
15. Desfile de Silleteros	Colombia	286
16. Día de los Muertos	Mexico	298
17. Diada de Sant Jordi	Catalonia	299
18. Diwali Festival of Lights	India	361
19. Falles	Spain	649
20. Festa del Renaixement Tortosa	Catalonia	299
21. Festival de la Marinera	Peru	478
22. Festival of the Sun	Peru	514
23. Fiesta de la Candelaria	Peru	300
24. Gion matsuri	Japan	282
25. Harbin Ice and Snow Festival	China	415
26. Heiva	Tahiti	286
27. Helsinki Samba Carnival	Finland	257
28. Holi Festival	India	553
29. Infiorata di Genzano	Italy	354
30. La Tomatina	Spain	349
31. Lewes Bonfire	England	267
32. Macys Thanksgiving	USA	335
33. Maslenitsa	Russia	271



34. Midsommar	Sweden	323
35. Notting hill carnival	England	383
36. Obon Festival	Japan	304
37. Oktoberfest	Germany	509
38. Onbashira Festival	Japan	247
39. Pingxi Lantern Festival	Taiwan	253
40. Pushkar Camel Festival	India	433
41. Quebec Winter Carnival	Canada	329
42. Queens Day	Netherlands	316
43. Rath Yatra	India	369
44. SandFest	USA	237
45. San Fermin	Spain	418
46. Songkran Water Festival	Thailand	398
47. St Patrick's Day	Ireland	320
48. The Battle of the Oranges	Italy	276
49. Timkat	Ethiopia	425
50. Viking Festival	Norway	262

Competition schedule

The challenge was managed using the Microsoft Codalab platform. The schedule of the competition was as follows:

- **December 1st, 2014:** Beginning of the quantitative competition, release of development and validation data.
- **February 15th, 2015**: Release of encrypted final evaluation data and validation labels. Participants can start training their methods with the whole data set.
- **March 13th, 2015:** Release of final evaluation data decryption key. Participants start predicting the results on the final evaluation data.
- **March 20th, 2015:** End of the quantitative competition. Deadline for submitting the predictions over the final evaluation data. Deadline for code submission. The organizers start the code verification by running it on the final evaluation data.
- **March 25th, 2015:** Deadline for submitting the fact sheets.
- **March 27th, 2015:** Release of the verification results to the participants for review. Top ranked participants are invited to follow the workshop submission guide for inclusion at CVPR 2015 ChaLearn Looking at People workshop proceedings.

Participation

- We created a different competition for each track, having the specific information and leaderboard.
- **A total of 54 users has been registered in the Codalab platform for cultural event recognition.**
- All these users were able to access the data for the Developing stage, and submit their predictions for this stage. For the final evaluation stage, a team registration was mandatory, and a total of **6 teams were successfully registered.**
- **Only registered teams had access to the data for the last stage.**
- The data was downloadable from the Codalab platform.

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Track on Cultural event recognition Results

Cultural Event Track				
Rank	Team name	Score	Features	Classification
1	MMLAB	0.855	Multiple CNN	Late weighted fusion of CNNs predictions.
2	UPC-ST	0.767	Multiple CNN	SVM and late weighted fusion.
3	MIPAL_SNU	0.735	Discriminant regions [18] + CNNs	Entropy + Mean Probabilities of all patches
4	SBU_CS	0.610	CNN-M [2]	SPM [10] based on LSSVM [16]
5	MasterBlaster	0.58	CNN	SVM, KNN, LR and One Vs Rest
6	Nyx	0.319	Selective-search approach [17] + CNN	Late fusion AdaBoost

- All the teams are using CNN
  - Pre-trained CNNs
- Many late-fusion strategies
  - From the final layer of the CNN
  - Use fine-tuned features as input to classifiers

Track on Cultural event recognition Results

- In the case of **Cultural Event Recognition**, all teams use only CNN for description.
- Not enough images for CNN training, pre-trained CNNs used.
- Different methodologies for CNN fusing.
  - Ad-hoc methodologies addressed to solve the problem
- No new methodologies applied
  - No specific methods to take advantage of the different available cues
- 85% of average precision obtained. There is still room for improvement.

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Track on Cultural event recognition Results

- Hard classes


Chinese New Year


Falles


Infiorata Genzano


Maslenitza


Nothin Hill Carn.

- Easy classes

Boston Marathon


Carnaval of Venice


Desf. Silleteros


Oktoberfest


Batle of Oranges

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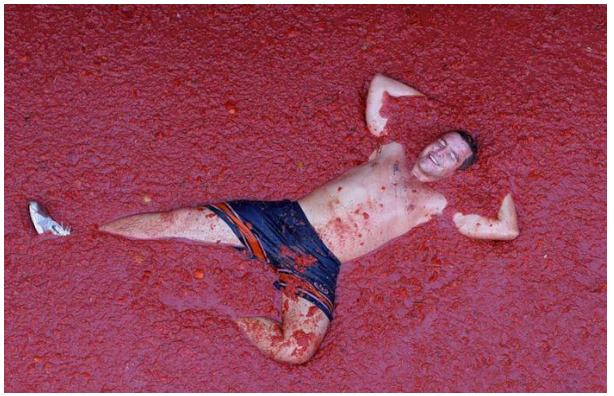
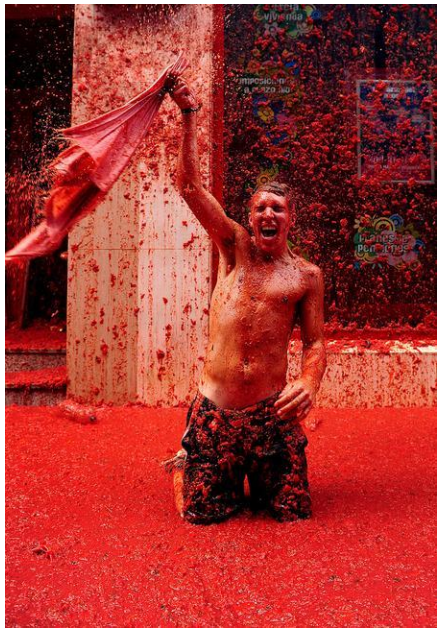
Track on Cultural event recognition Results

- No colour cue used may be the reason for bad results on classes like Tomatina

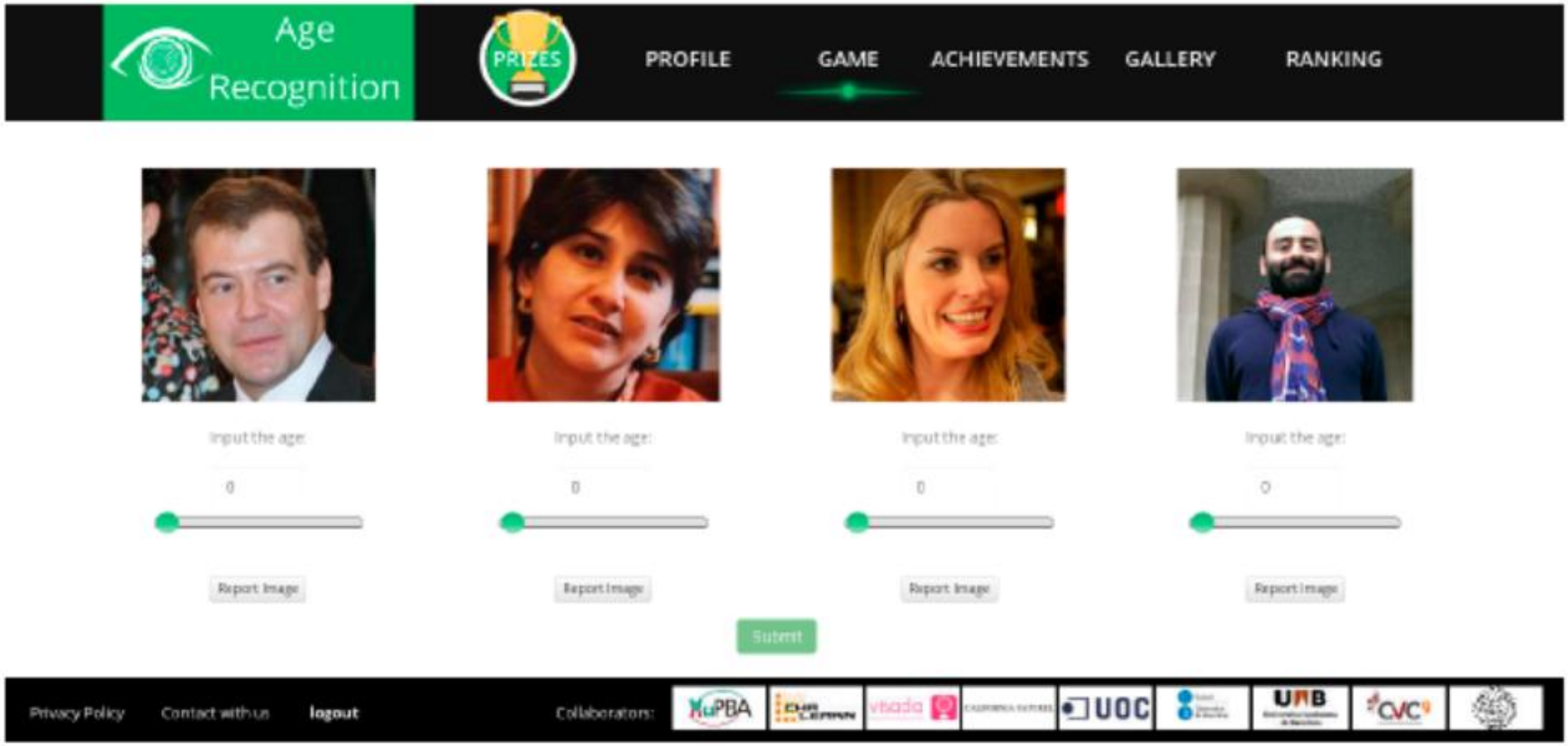







Age recognition

http://gesture.chalearn.org/

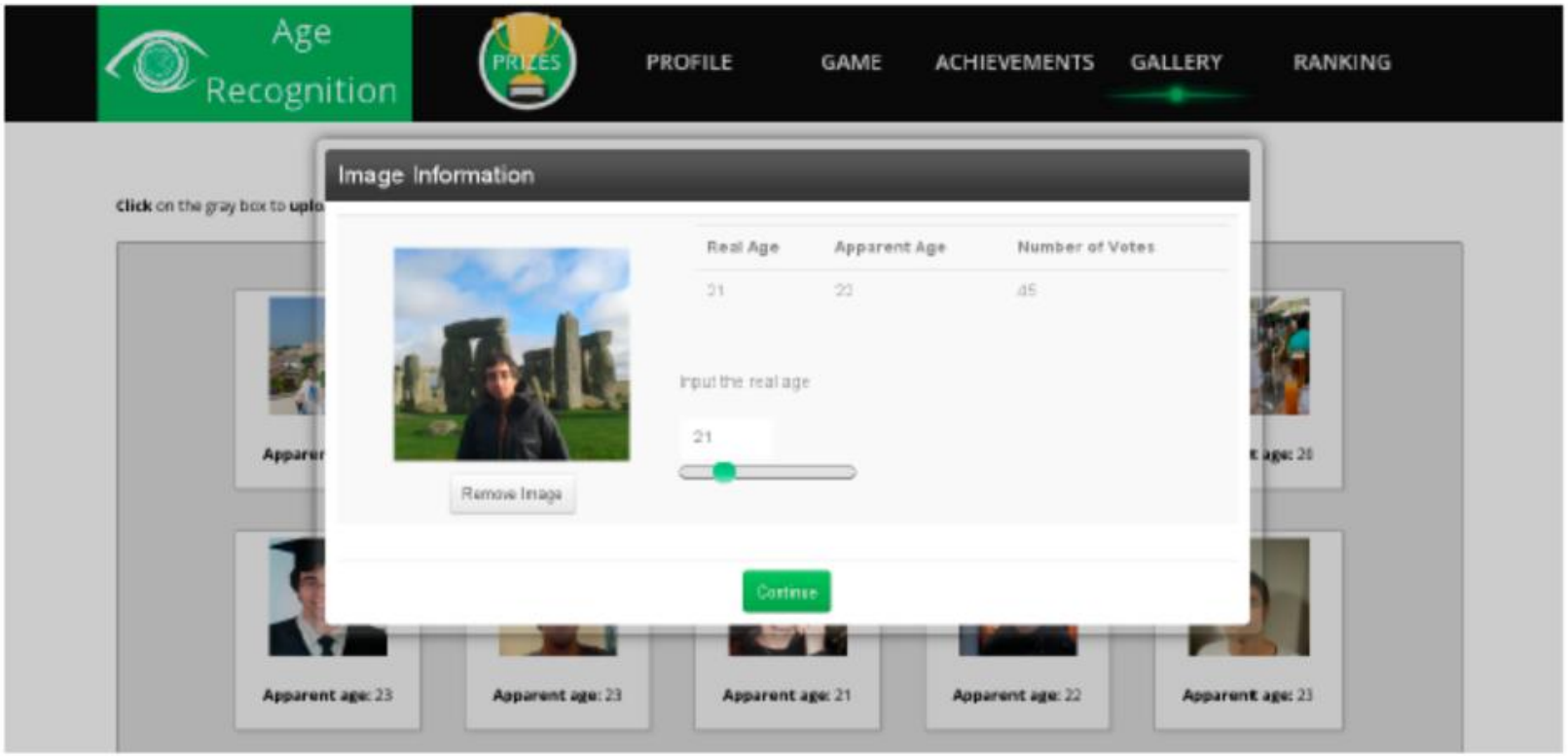


Crowdsourcing application using Facebook API for uploading and voting appatent age

http://sunai.uoc.edu:8005

Age recognition

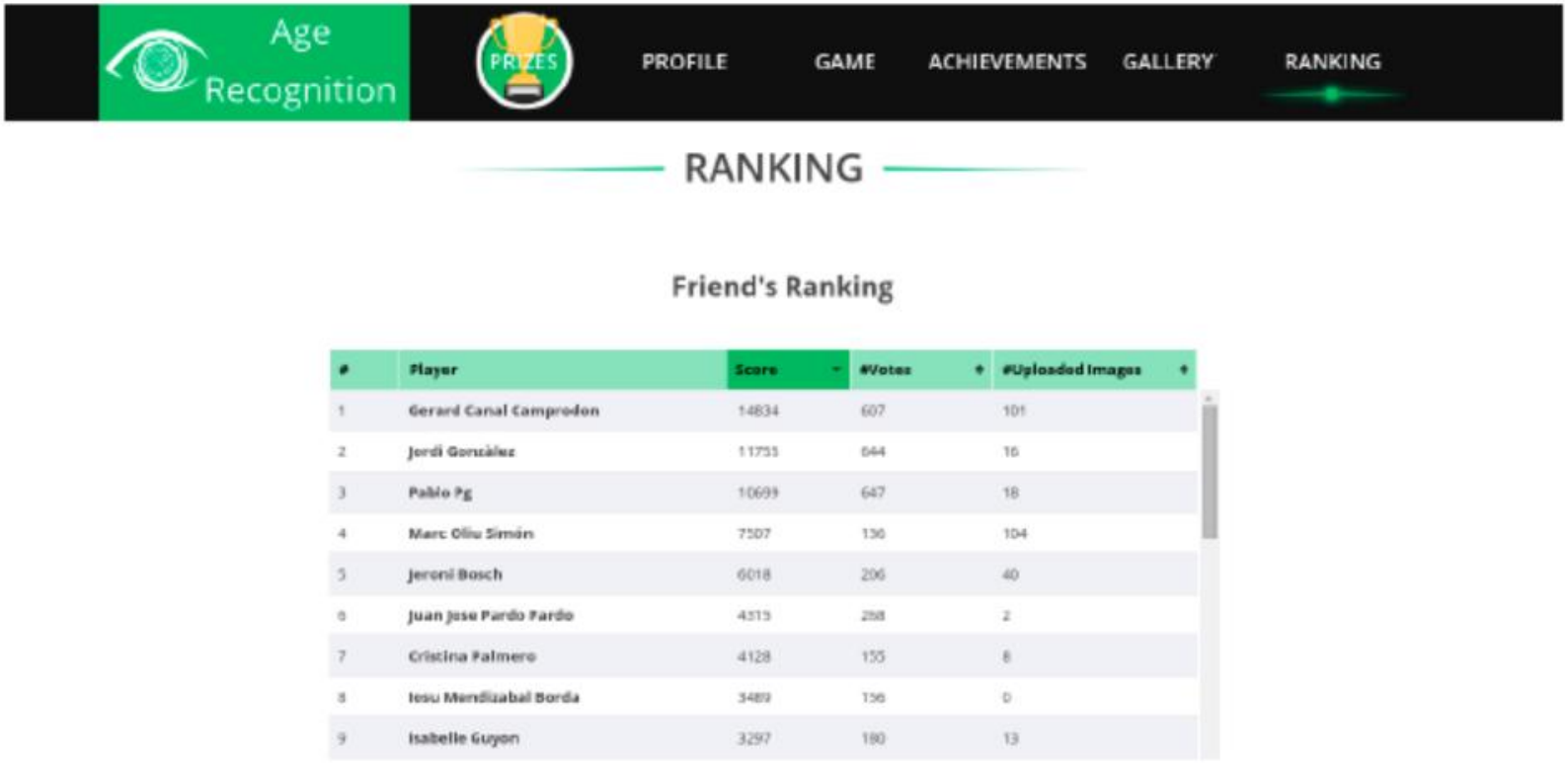
http://gesture.chalearn.org/



Profile: your uploaded photos, the real age, appatent age and number of votes

Age recognition

http://gesture.chalearn.org/



Gamification fashion: Ranking among colleagues and rest of participants.
Winning points for voting near mean vote, number of voted images, number of images uploaded, etc.

Updated data

http://gesture.chalearn.org/

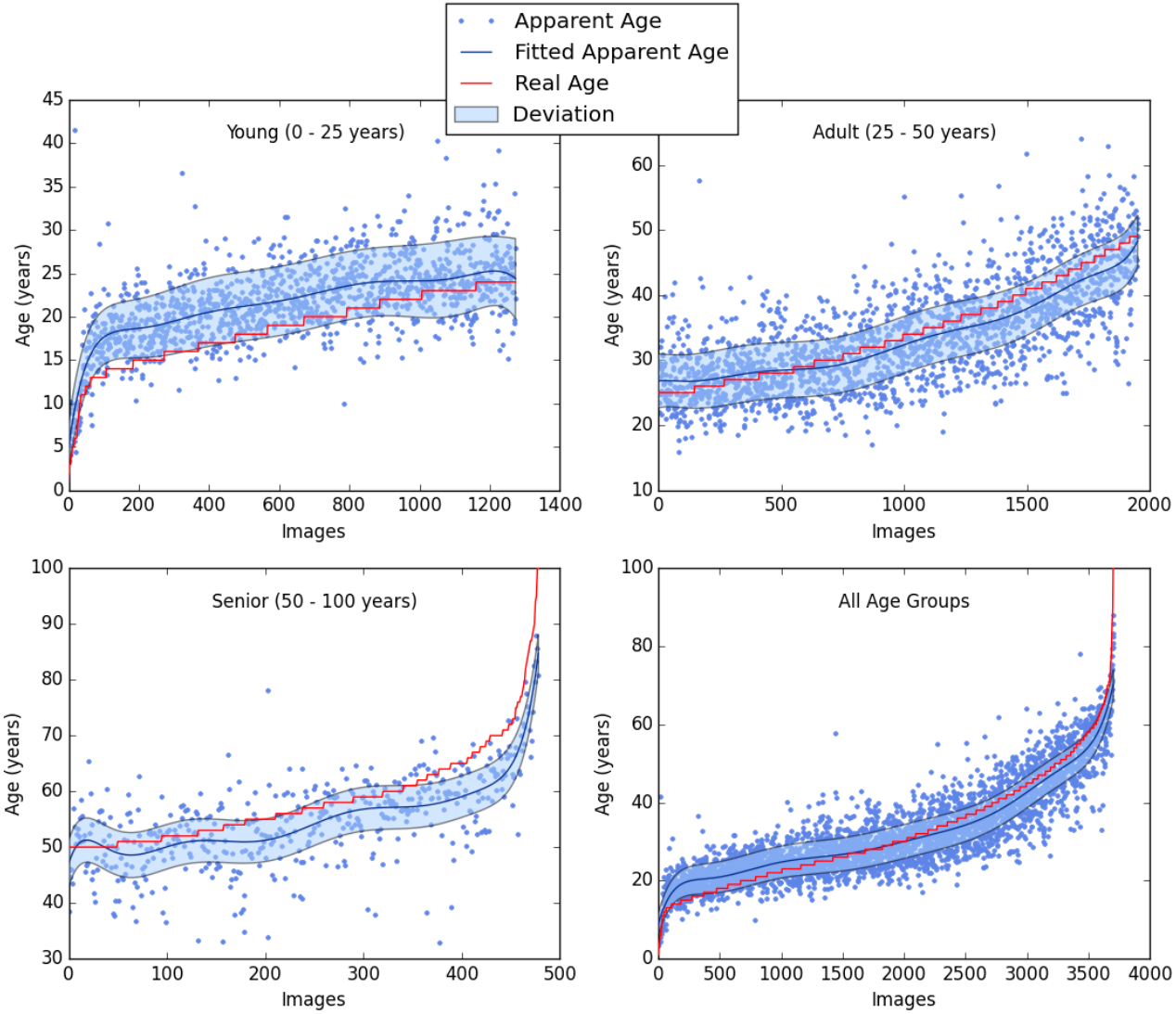
Features		HuPBA[1]	AgeGuess[2]	Total
Images		1506	3359	**4865**
Users	female	44	1828	1872
	male	110	1143	1253
	Total	154	2971	**3125**
Votes	female	1753	75136	76889
	male	14897	53117	68004
	Total	16640	128253	**144893**

[1] HuPBA web application: `http://sunai.uoc.edu:8005`

[2] AgeGuess web application: `http://www.ageguess.org/`

Age recognition

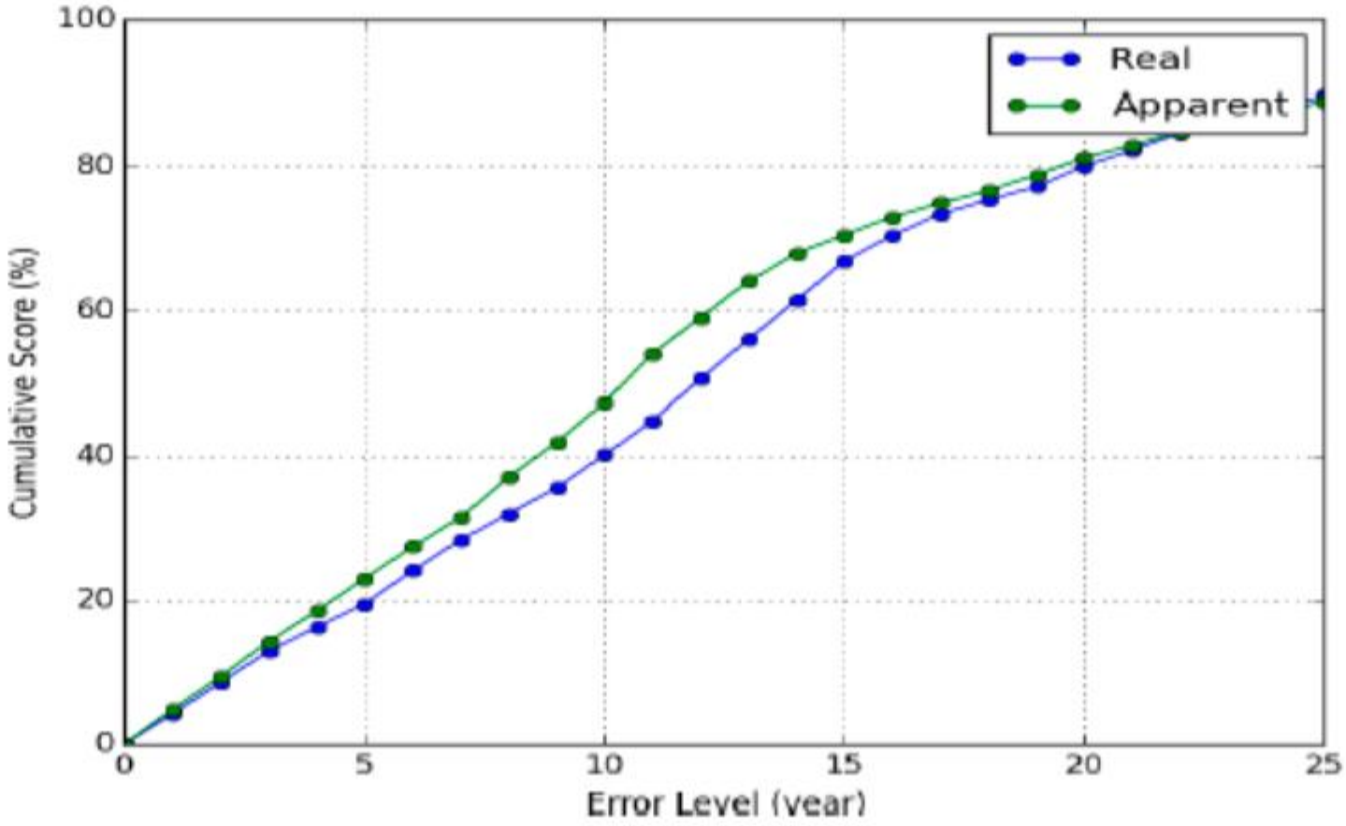
http://gesture.chalearn.org/



Age recognition

http://gesture.chalearn.org/

Evaluation

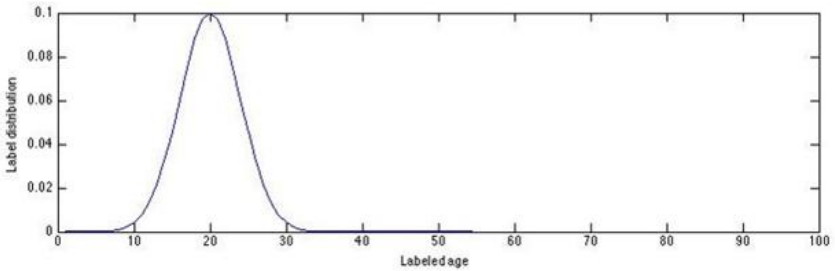


Interesting findings: with the previous version of the apparent age data set.
The baseline method (BIF features) showed better performance with apparent age than with real age.

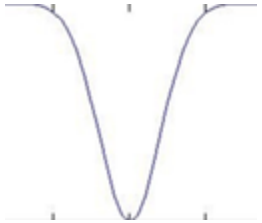
Age recognition

http://gesture.chalearn.org/

Evaluation



$$\mathcal{E} = 1 - e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$



Competition already started: join us!

https://www.codalab.org/competitions/4711

Schedule details:

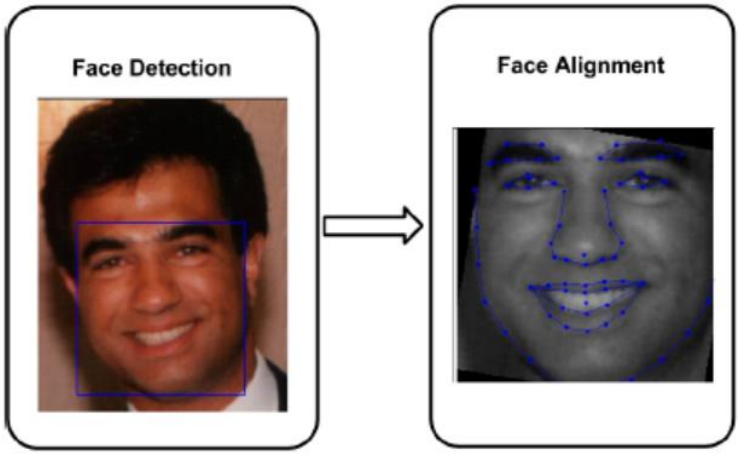
http://gesture.chalearn.org/

Age recognition

http://gesture.chalearn.org/

Evaluation – competition open until middle september 2015
Performed baseline

- **Deep Learning Method**: based on Convolutional Neural Networks (CNN)
- **Face Detection**: OpenCV Viola & Jones implementation [1].
- **Grey Scale**: Transform RGB to grey scale.
- **Face Alignment**: Shape regressor using 68 facial landmarks by Shaoqing et al. [2]



1 Bradski, G. published at *Dr. Dobb's Journal of Software Tools* in 2000

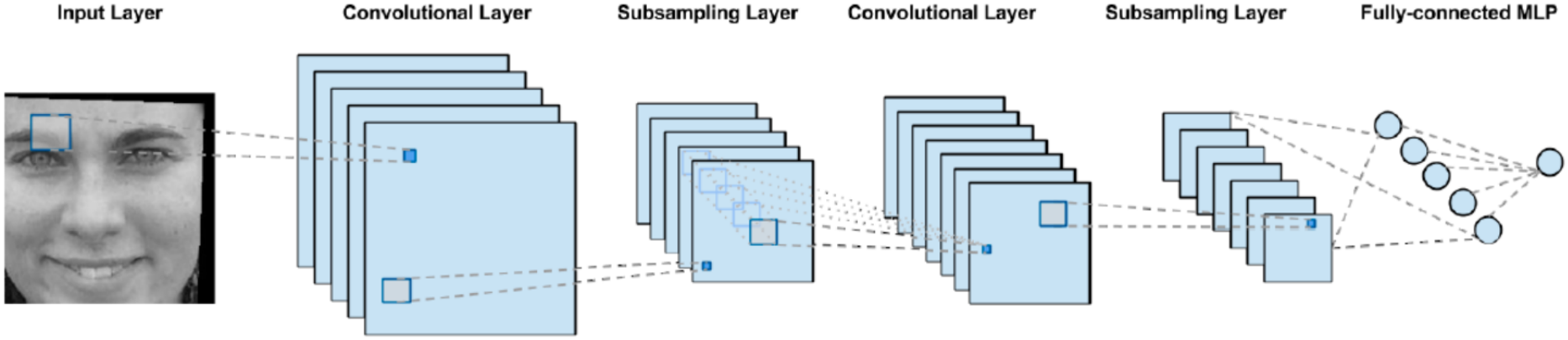
2 Ren, Shaoqing and Cao, Xudong and Wei, Yichen and Sun, Jian, *Face Alignment at 3000 FPS via Regressing Local Binary Features*, CVPR 2014

Age recognition

http://gesture.chalearn.org/

Evaluation – competition open until middle september 2015

Performed baseline



Layer	Input size	Output size	Filter size	Pooling size
Conv1	200×200	190×190	$10 * (11 \times 11)$	-
Pool1	190×190	95×95	-	$(2, 2)$
Conv2	95×95	89×89	$20 * (7 \times 7)$	-
Pool2	89×89	44×44	-	$(2, 2)$
Conv3	44×44	40×40	$40 * (5 \times 5)$	-
Pool3	40×40	20×20	-	$(2, 2)$
Full1	$16,000$	500	-	-
Full2	500	200	-	-
Full3	200	1	-	-

Age recognition

http://gesture.chalearn.org/

Evaluation – competition open until middle september 2015
Performed baseline

Results

	User	Team Name	Error
1	Raducu		0.488526 (1)
2	mpopescu		0.542466 (2)
3	palm_seu		0.589424 (3)
4	all_about_faces		0.603691 (4)
5	cvl		0.608589 (5)
6	PabloPG		0.686668 (6)

Already outperformed by 4 participants on 12/7/2015 (in less than one month competition)
Competition still opened until middle september, join and have fun!:

https://www.codalab.org/competitions/4711
Schedule details:
http://gesture.chalearn.org/

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Context of the Workshops

Broader workshop scope focus on Looking at People:

- Gesture, posture, and sign recognition, analysis and synthesis
- Face recognition, analysis and synthesis
- Body motion analysis and synthesis, and action/interaction recognition and spotting
- Psychological and behavioral analysis
- Multi-modal strategies for gesture recognition and spotting
- Data sets and evaluation protocols
- Computer Vision applications of human pose recovery, gesture recognition and spotting

ChaLearn Looking at People Challenges and Workshops

http://gesture.chalearn.org/

ICCV 2015 Workshop and Challenge on action recognition, **cultural event recognition**, and apparent age recognition

Total number of images	Number of countries for all the events	Number of images per category	Number of categories	Number of test images	Number of validation images	Number of training images
28705	45	>200	100	8669	5704	14332

CULTURAL EVENT RECOGNITION

- First database on cultural events.
- More than 25,000 images representing 90 different categories.
- High intra- and inter-class variability.
- For this type of images, different cues can be exploited like garments, human poses, crowds analysis, objects and background scene.
- The evaluation metric will be the recognition accuracy.

Ongoing events

ChaLearn Looking at People Challenges and Workshops

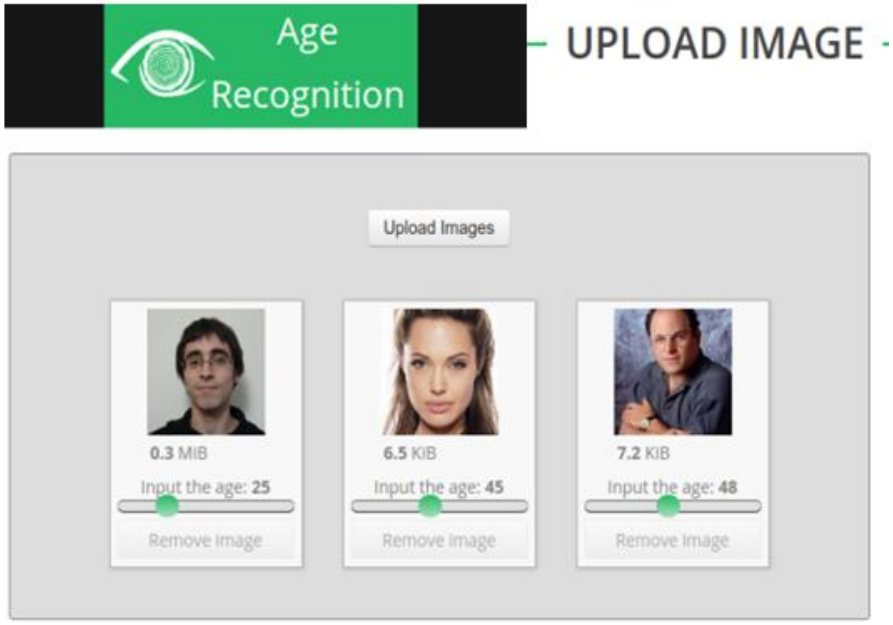
http://gesture.chalearn.org/

ICCV 2015 Workshop and Challenge on action recognition, cultural event recognition, and **apparent age recognition**

Range of labeled ages	Information from the labelers	Contains real age	Contains estimated age by the labelers	Number of labelers	Number of actors	Number of images
0-85	Nationality, age, and gender of the labelers	YES	YES	> 3600	>2000	5000

AGE ESTIMATION

- More than 5,000 faces from more than 2000 different people.
- Images with background.
- Non-controlled environments.
- Non-labeled faces neither landmarks, making the estimation problem even harder.
- One of the first datasets in the literature including estimated age labeled by many users to define the ground truth with the objective of estimating the age.
- The evaluation metric will be pondered by the mean and the variance of the labeling by the participants.
- The dataset also provides for each image the real age although not used for recognition (just for analysis purposes). In the same way for all the labelers we have their nationality, age, and gender, which will allow analyzing demographic and other interesting studies among the correlation of labelers.



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ChaLearn Looking at people news

ICCV 2015 COMPETITIONS AND WORKSHOP!! STARTING 15th JUNE!

https://www.codalab.org/competitions/ http://gesture.chalearn.org/

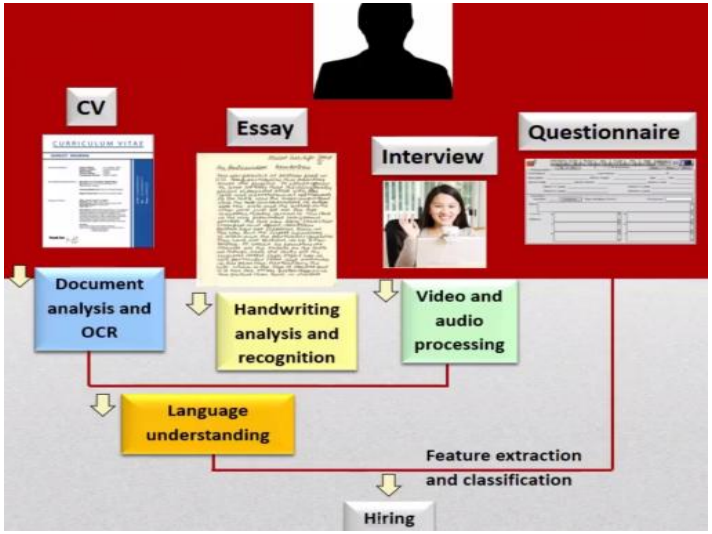
Economic prizes (1500$,1000$,500$ for three top positions), travel grants (500$ for each top 3 position), NVIDIA Titan X devices (for all three winners!), winner certificate

Best papers will be invited to a high impact factor SI on LAP **(IJCV: special issue deadline on LAP beginning 2016). Best paper workshop award: NVIDIA Titan X. Call for papers opened.**

Ongoing events

http://gesture.chalearn.org/

ChaLearn LAP challenges and news:
http://gesture.chalearn.org/



Organization of ChaLean Looking at People requires:
-Good ideas to solve real problems focused on humans
-Collecting data
-Labeling tools
-Dissemination and repositories
-Baseline designs based on state of the art approaches
-Online platform for the competition
-Sponsoring
-Presentation of the results in a relevant events
-Organization of special issues and challenge report documents, making competition data public for the scientific community

For each competition many organizers contribute. Our plan is to perform yearly challenges.

Feel free to contact us if you want to be included in our ChaLearn LAP mailing list or collaborate in some aspect propose ideas related to ChaLearn Looking at People competitions:

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Thank you!

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