ChaLearn Looking at People: A Review of Events and Resources

Sergio Escalera [1,2], Xavier Baró [2,3], Hugo Jair Escalante [4,5], Isabelle Guyon [4,6]

[1] Dept. Mathematics and Computer Science, University of Barcelona, Spain;
[2] Computer Vision Center, UAB, Barcelona, Spain; [3] EIMT, Open University of Catalonia, Barcelona, Spain;
[4] ChaLearn, California, USA; [5] INAOE, Puebla, Mexico; [6] Université Paris-Saclay, Paris, France

Overview

Looking at People (LAP) is a challenging area of research that deals with the problem of automatically recognizing people in images, detecting and describing body parts, inferring their spatial configuration, performing action/gesture recognition from still images or image sequences, often including multi-modal data.

This work reviews associated events and introduce the **ChaLearn LAP** platform where public resources (including code, data and preprint papers) related to the organized events are available. The ChaLearn official webpage can be found at http://chalearnlap.cvc.uab.es

- We started in 2011 to run challenges related to human action/activity and gesture recognition.
- We have regularly organized events in a **series of competitions** covering all aspects of visual analysis of humans.
- So far we have organized more than 10 international challenges and events in this field

ChaLearn

ChaLearn (http://chalearn.org) is a non-profit organization with vast experience in the organization of academic challenges. ChaLearn is interested in all aspects of challenge organization, including data gathering procedures, evaluation protocols, novel challenge scenarios (e.g., *coopetitions*), training for challenge organizers, challenge analytics, results dissemination and, ultimately, advancing the state-of-the-art through challenges.

Historic of ChaLearn LAP events

Events are split into *challenges and their associated workshops*, *special issues*, and books of the Springer Series on *CiML.*

Tracks	Workshops	Dataset	Special issue	Winner and score
One-Shot-Learning Gesture Challenge	Gesture recognition workshops CVPR 2011/2012, ICPR 2012	CGD 2011 Data	IJCV LAP 2016	alfnie: 0.07099 (Error)
Multimodal Gesture Recognition	Multi-modal Gesture Recognition Workshop ICMI 2013	Multimodal Gesture Recognition: Montalbano V1	JMLR Gesture 2014, TPAMI HuPBA 2016 and IJCV LAP 2016	IVA MM: 0.12756 (Error)
Human Pose Recovery (First round)	ChaLearn LAP Workshop ECCV 2014	Human Pose	TPAMI HuPBA 2016 and IJCV LAP 2016	ZJU: 0.194144 (Accuracy)
Action/Interaction Recognition (First round)	ChaLearn LAP Workshop ECCV 2014	Action/Interaction Recognition	JMLR Gesture 2014, TPAMI HuPBA 2016 and IJCV LAP 2016	CUHK-SWJTU: 0.507173 (Accuracy)
Gesture Recognition	ChaLearn LAP Workshop ECCV 2014	Multimodal Gesture Recognition: Montalbano V2	JMLR Gesture 2014, TPAMI HuPBA 2016 and IJCV LAP 2016	LIRIS: 0.849987 (Accuracy)
Action/Interaction Recognition (Second round)	ChaLearn LAP Workshop CVPR 2015	Action/Interaction Recognition	JMLR Gesture 2014, TPAMI HuPBA 2016 and IJCV LAP 2016	MMLAB: 0.855 (Accuracy)
Cultural Event Recognition (First round)	ChaLearn LAP Workshop CVPR 2015	Cultural Event V1	IJCV LAP 2016	VIPL-ICT-CAS: 0.854 (Accuracy)
Apparent age Estimation (First round)	ChaLearn LAP Workshop ICCV 2015	Apparent age V1	IJCV LAP 2016 and TPAMI Faces 2017	CVL ETHZ: 0.264975 (Error)
Cultural Event Recognition (Second round)	ChaLearn LAP Workshop ICCV 2015	Cultural Event V2	IJCV LAP 2016	SIAT MMLAB: 0.9349 (Accuracy)
Apparent age Estimation (Second round)	ChaLearn LAP Workshop CVPR 2016	Apparent age V2	IJCV LAP 2016 and TPAMI Faces 2017	OrangeLabs: 0.2411 (Error)
Accessories Classification	ChaLearn LAP Workshop CVPR 2016	Accessories Classification	IJCV LAP 2016	SIAT MMLAB: 0.9349 (Accuracy)
Smile and Gender Classification	ChaLearn LAP Workshop CVPR 2016	Smile and Gender Classification	IJCV LAP 2016	SIAT MMLAB: 0.8926 (Accuracy)
First impressions Challenge (First round)	ChaLearn LAP Workshop ECCV 2016	First impressions	IJCV LAP 2016, TAC Personality 2017 and TPAMI Faces 2017	NJU-LAMDA: 0.4025 (Accuracy)
First impressions Challenge (Second round)	ChaLearn LAP Workshop ICPR 2016	First impressions	IJCV LAP 2016, TAC Personality 2017 and TPAMI Faces 2017	BU-NKU: 0.913 (Accuracy)
Isolated Gesture Recognition	ChaLearn LAP Workshop ICPR 2016	Isolated Gesture Recognition	JMLR Gesture 2014, TPAMI HuPBA 2016 and IJCV LAP 2016	FLiXT: 0.569 (Accuracy)
Continuous Gesture Recognition	ChaLearn LAP Workshop ICPR 2016	Continuous Gesture Recognition	JMLR Gesture 2014, TPAMI HuPBA 2016 and IJCV LAP 2016	ICT NHCI: 0.2869 (Accuracy)
Context of Experience Track	ChaLearn LAP Workshop ICPR 2016	Context of Experience	IJCV LAP 2016	uklu: 0.69697 (Accuracy)

Table I: Summary of organized ChaLearn LAP events and results (2011-2017).

Timeline

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

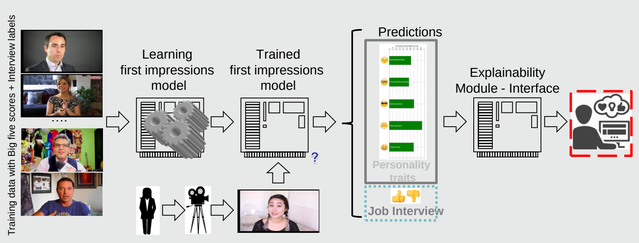
CIML Series

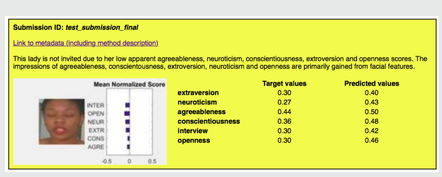
Starting in 2017, we are running the Springer Series on Challenges in Machine Learning, the first series of books entirely dedicated to collect papers associated to successful competitions in machine learning and related fields (http://www.springer.com/series/15602).

Scope includes 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. This new series will be one of our main forums for disseminating results of competitions in ChaLearn LAP.

Final Remarks

The organized events helped considerably to advance the state of the art in different subfields of CVPR. Currently, we are organizing a new series of competitions within the field of LAP, including face and body analysis. In particular, 2017 events will focus on explainable computer vision and machine learning models for apparent personality analysis.





Acknowledgments

We thank Oriol Suils for his collaboration in the implementation of the new ChaLearn LAP webpage. We thank all the participants and co-organizers of the organized ChaLearn LAP events. We appreciate the support of the sponsors of the different organized events, including Microsoft Research, Google, Nvidia Corporation, Amazon, Facebook, and Disney Research, among others. This work has been partially supported by Spanish projects TIN2013-43478-P, TIN2015-66951-C2-2-R and TIN2016-74946-P, the European Commission Horizon 2020 granted project SEE.4C under call H2020-ICT-2015 and CONACYT under project grant CB2014-241306. This effort was initiated by the DARPA Deep Learning program and was supported by the US National Science Foundation (NSF) under grants ECCS 1128436 and ECCS 1128296, the EU Pascal2 network of excellence and the Challenges in Machine Learning organization (ChaLearn). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the sponsors.

Contact e-mail: sergio.escalera.guerrero@gmail.com
Additional information: http://chalearnlap.cvc.uab.es