Alex Hernández-García

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Current position

Dec 2020-*currently* | **Postdoctoral researcher** at Mila - Quebec Artificial Intelligence Institute and the Université de Montréal
AI for good, climate change

Education

Feb 2016-Nov 2020 | **PhD** in Cognitive Science, Universität Osnabrück & EyeQuant.
Title: Data augmentation and image understanding
Funded by the Marie Skłodowska-Curie Innovative Training Network NextGenVis project from the European Union H2020 Programme (H2020-MSCA-ITN-2014)

Sep 2015-Feb 2016 *(unfinished)* | PhD in Multimedia and Communications, Universidad Carlos III de Madrid.
Topic: Automatic prediction of emotion and attention through video descriptors.
Funded by a fellowship (FPU) by the Spanish Ministry of Education.

Sep 2014-Sep 2015 | Master of Science (**M.Sc.**), Master in Multimedia and Communications, Universidad Carlos III de Madrid. Taught in English. **GPA: 9,35/10**
With a fellowship from Department of Signal Theory and Communications.

Sep 2009-Mar 2014 | Bachelor of Science (**B.Sc.**), Audiovisual Systems Engineering (bilingual option), Universidad Carlos III de Madrid. **GPA: 7,8/10 (highest of group)**
Aesthetics assessment of videos through visual descriptors and automatic polarity annotation (**Grade: 10/10 honors distinction**) — Director: Prof. Fernando Fernández Martínez

Sep 2010-Jun 2014 *(unfinished, 72 ECTS)* | Degree in Audiovisual Communication, Universidad Carlos III de Madrid. GPA: 8,3/10

Research and Publications

Broad research interests: machine learning, climate change, computational neuroscience, vision, open science.

Other research experience

Oct 2019-Dec 2020 | 0-Year Student at the Max Planck School of Cognition
Mentorship of the early stage students.

Oct 2018-January 2019 | Internship at the Cognitive and Brain Sciences Unit, Cambridge (UK)
Biologically inspired data augmentation and computational neuroscience
Supervisor: Dr. Tim Kietzmann

Jan 2018-March 2018 | Internship at Spinoza Centre for Neuroimaging, Amsterdam
Image identification from brain activity using the population receptive field model and image saliency models
Supervisor: Dr. Serge Dumoulin

Oct 2013-Feb 2016 | Research assistant at the Department of Signal Theory and Communications, Universidad Carlos III de Madrid.
Computer vision, machine learning and image processing.
Supervisors: Prof. Fernando Díaz de María and Dr. Fernando Fernández Martínez

Publications (selection)

- "Rethinking supervised learning: insights from biological learning and from calling it by its name". A. Hernandez-Garcia. Workshop on Shared visual representations between humans and machines (SVRHM), NeurIPS 2020.
- "Computational methods for continuous eye-tracking perimetry based on spatio-temporal integration and a deep recurrent neural network ". A. Grillini, A. Hernandez-Garcia, R. Renken, G. Demaria, F. Cornelissen. (under review).
- "A machine learning pipeline to predict vegetation health". T. Lees, G. Tseng, A. Hernandez-Garcia, C. Atzberger, S. Dadson, S. Reece. Workhop on Tackling climate change with machine learning, International Conference on Learning Representations (ICLR), 2020.
- "Learning representational invariance instead of categorization". A. Hernández-García, P. König. Workhop on pre-registration, International Conference on Computer Vision (ICCV), 2019.
- "Learning robust visual representations using data augmentation invariance". A. Hernández-García, P. König, Tim C. Kietzmann. Conference on Cognitive Computational Neuroscience (CCN), 2019.
- "Global visual salience of competing stimuli". A. Hernández-García, R. Ramos Gameiro, A. Grillini, P. König. PsyArXiv:z7qp5. 2019. Journal of Vision
- "Further advantages of data augmentation on convolutional neural networks". A. Hernández-García, P. König. International Conference on Artificial Neural Networks (ICANN), 2018. **Best Paper Award**
- "Data augmentation instead of explicit regularization". A. Hernández-García, P. König. arXiv:1806.03852. 2018.
- "Deep neural networks trained with heavier data augmentation learn features closer to representations in hIT". A. Hernández-García, Johannes Mehrer, Nikolaus Kriegeskorte, P. König, Tim C. Kietzmann. Conference on Cognitive Computational Neuroscience (CCN), 2018.
- "Do deep nets really need weight decay and dropout?". A. Hernández-García, P. König. arXiv:1802.07042. 2018.
- "Perceived emotion from images through deep neural networks". A. Hernández-García. Affective Computing and Intelligent Interaction, Doctoral Consortium, 2017.
- "Emotion and attention: predicting electrodermal activity through video visual descriptors". A. Hernández-García, F. Fernández-Martínez, F. Díaz de María. Int. Workshop on Affective Computing and Emotion Recognition (ACER), 2017.
- "Comparing visual descriptors and automatic rating strategies for video aesthetics prediction". A. Hernández-García, F. Fernández-Martínez, F. Díaz de María. Journal Signal Processing: Image Communication, 2016.
- "Succeeding metadata based annotation scheme and visual tips for the automatic assessment of video aesthetic quality in car commercials". F. Fernández-Martínez, A. Hernández-García, F. Díaz de María. International Journal Expert Systems With Applications, 2015.
- "Combining audio-visual features for viewers' perception classification of Youtube car commercials". F. Fernández-Martínez, A. Hernández-García, A. Gallardo-Antolín, F. Díaz de María. Workshop on Speech, Language and Audio in Multimedia (SLAM), 2014.

Talks (selection)

- "Data augmentation invariance for learning robust visual representations". Neuromatch, The Internet (online presentation). March 2020.
- "Learning representational invariance instead of categorization". International Conference on Computer Vision, Workshop on pre-registration in Computer Vision, Seoul (Republic of Korea). November 2019.
- Data augmentation for improved regularization and invariance learning. Department of Brain and Cognitive Engineering, Korea University, Seoul (Republic of Korea). November 2019.
- "Learning robust visual representations using data augmentation invariance". Computational Cognition, Osnabrück (Germany). October 2019.

- "More than more data: undervalued advantages of data augmentation for deep learning and computational neuroscience". Neural Information Processing Group, University of Tübingen, Tübingen (Germany). July 2019.
- Data augmentation: undervalued advantages for deep learning and computational neuroscience. Cognitive Neuroscience Center, University Medical Center Groningen, Groningen (Netherlands). June 2019
- On the advantages of data augmentation for deep learning and computational neuroscience. Neural Dynamics of Visual Cognition Lab, Freie Universität Berlin, Berlin (Germany). February 2019
- "Data augmentation as a biologically plausible alternative to explicit regularization in CNNs". Institute of Informatics and Telecommunications, NCSR Demokritos, Athens (Greece). October 2018.
- Data augmentation instead of explicit regularization. Group of Multimedia Processing, University Carlos III of Madrid, Madrid (Spain). May 2018

Summer schools attended

- International Computer Vision Summer School (ICVSS), Sicily, July 2015
- Eastern European Machine Learning Summer School (EEML), ~~Krakow~~ online, July 2020
- Deep Learning + Reinforcement Learning Summer School (DLRL), ~~Montreal~~ online, August 2020
- Oxford | Berlin Summer School on Open Research, ~~Berlin~~ online, September 2020.

Awards and Scholarships

- **Best Paper Award** at the International Conference on Artificial Neural Networks (ICANN) 2018.
- Selected PhD candidate for the **Marie Skłodowska-Curie Innovative Training Network** NextGenVis, under the European Union H2020 Programme (H2020-MSCA-ITN-2014)
- **Excellence Grant of Comunidad de Madrid** for excellent results at high school and PAU (university entrance exam) **(Grade: 9,24/10)**. Year 2009/2010. Work of teaching support: "Analysis and Report of MATLAB Tutorials" — Director: Prof. Emilio Parrado Hernández
- Diploma from Universidad Carlos III de Madrid for getting the **32nd position at the university entrance exams**. 2009/2010.

Other Work Experience and Contributions

Reviewer of	CVPR 2021, ICLR 2021, SVRHM 2020, ICML 2020, CCN 2018—2020, AIAI 2019, ICANN 2018
Sep 2014-Jun 2015	Laboratory teacher in the Department of Signal Theory and Communications, Universidad Carlos III de Madrid and tutor of Final Degree Projects. Multimedia Information Processing, Digital Television, Digital Image Processing

Languages

Spanish:	Native
English:	Near-native. CPE 71/100 (C2) (2014), TOEFL (iBT) 103 (2014)
German:	High. C1, Volkshochschule Berlin (2017)
French:	High-intermediate. B2, Universität Stuttgart (2012)
Italian:	Basic-intermediate
Greek:	Basic

Additional Information and Technical Skills

- Programming Languages: Python, MATLAB, bash, C, Java.
- Deep learning frameworks: TensorFlow, Keras
- Web Development Technologies: HTML5, CSS, XML, Javascript, etc.
- Misc: git, vim, tmux, ssh, LaTeX, Markdown, Liquid, Jekyll, etc.
- Music education on violin. Orchestras: JORCAM, Orchestra of the Universidad Carlos III (concert master), Orchestra of the Universität Stuttgart, Symphonic Orchestra of the Humboldt University.
- Violinist of The Broken Jug Ramblers, bagpiper of Lume de Biqueira.