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Personal	Phone: (412) 268 4706 Email: ftorre@cs.cmu.edu	Citizenship: Spain U.S. Permanent Resident
Research Interests	<p>Human Sensing: Modeling and understanding human behavior (i.e. expression, emotion, activity) from sensory data (e.g. video, motion capture, audio). This work is motivated by applications in the fields of human health, computer graphics, machine vision, biometrics, and human-machine interface. I lead the Human Sensing Laboratory at CMU, for more information see (http : //www.humansensing.cs.cmu.edu).</p> <p>Augmented Reality/Virtual Reality: Developing new computer vision algorithms for augmented reality and virtual reality. In particular, algorithms for 3D reconstructions of body and faces for immersive 3D experiences, and new applications for augmented reality glasses.</p> <p>Data focused Computer Vision: Developing new machine learning algorithms for computer vision that are focused on the data, rather than the model. Examples include algorithms for automatic balancing the data, new augmentation techniques, generative models for learning from few training samples, ...</p>	
Education	LA SALLE SCHOOL OF ENGINEERING 1997-2002 Ph.D. Electrical Engineering	Barcelona, Spain
	LA SALLE SCHOOL OF ENGINEERING 1995-1996 M.S. Electrical Engineering and Computer Sciences	Barcelona, Spain
	LA SALLE SCHOOL OF ENGINEERING 1991-1994 Bachelor of Electric Engineering and Computer Sciences	Barcelona, Spain
Experience	CARNEGIE MELLON UNIVERSITY, 07/2011-present Associate Research Professor at the Robotics Institute. Adjunct Professor at Electrical and Computer Engineering Department (since 2009). Affiliated Faculty at Machine Learning Department (since 2013).	Pittsburgh, Pennsylvania
	OCULUS, 04/2019-04/2021 Research Scientist Manager	Pittsburgh, Pennsylvania
	FACEBOOK, 01/2017-04/2019 Research Scientist Manager	Mountain View, California
	FACIOMETRICS LLC (ACQUIRED BY FACEBOOK) 05/2014-12/2016 CEO and Founder.	Pittsburgh, Pennsylvania

CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania
07/2011-present
Associate Research Professor at the Robotics Institute.
Adjunct Professor at Electrical and Computer Engineering Department (since 2009).
Affiliated Faculty at Machine Learning Department (since 2013).

CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania
07/2005-06/2011
Assistant Research Professor at the Robotics Institute.

CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania
01/2003-06/2005
Visiting Research Scientist.

GATSBY COMPUTATIONAL NEUROSCIENCE UNIT, London, UK
09/2002-12/2002
Visiting Scientist.

CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania
07/2002-08/2002
Visiting Research Scientist.

LA SALLE SCHOOL OF ENGINEERING, Barcelona, Spain
1995–Present
Adjunct Professor, (02/2002–present).
Associate Professor, (2000–2002) Department of communications and signal theory.
Assistant Professor, (1995–1999) Department of communications and signal theory.

BROWN UNIVERSITY, Providence, Rhode Island
02/2002-06/2002
Post-doctoral researcher working on statistical modeling of neural data.

BROWN UNIVERSITY, Providence, Rhode Island
02/2001-09/2001
Visiting researcher working on visual learning and statistical modeling of neural coding.

BROWN UNIVERSITY, Providence, Rhode Island
07/2000-08/2000
Visiting researcher working on robust subspace learning.

XEROX PALO ALTO RESEARCH CENTER, Palo Alto, CA
06/1999-08/1999
Summer intern working on robust subspace learning.

INSTITUTE FOR ADVANCED COMPUTER STUDIES, College Park, MD
01/1999-05/1999
Research visitor developing Bayesian visual tracking techniques.

QUEEN MARY AND WESTFIELD COLLEGE, London, England
07/1997-09/1997
Research visitor working on an appearance-based face tracking system.

- Languages** Bilingual **Spanish-Catalan**. Fluent both written and spoken **English**.
- Awards**
- Outstanding Paper Award* at International Conference on Learning Representations 2021.
- Best Demo Award* at IEEE Automatic Face and Gesture Recognition 2015.
- Best Student Paper Award* at IEEE Conference on Computer Vision and Pattern Recognition 2012.
- Cooliest Faculty of the Year* at the Robotics Institute 2008.
- 50 Finest* of Pittsburgh 2008. Raised \$2, 200 dollars for Cystic Fibrosis.
- Catalonian BE 2000 Grant, Fellowship, 6/2000–8/2000, \$2,500.
- Catalonian BE 2001 Grant, Fellowship, 2/2001–7/2001, \$7,500.
- Consulting**
- Intuit. 03/2008 - 08/2008
- Disney. 04/2011 - 07/2011
- Tandent Vision. 04/2011 - 07/2012
- Allergan. 10/2014-11/2016
- Professional Services**
- Program Chair or Organizer:**
- Program co-chair, fifth Workshop on Computer Vision for AR/VR, ICCV 2021.
 - Program co-chair, fourth Workshop on Computer Vision for AR/VR, CVPR 2020.
 - Program co-chair, third Workshop on Computer Vision for AR/VR, CVPR 2019.
 - Program co-chair, Applications of Egocentric Vision Workshop (EgoApp), BMVC 2019.
 - Program co-chair, Workshop BMVC Workshop on Social Interaction/Behaviour, BMVC 2018.
 - Program co-chair, Workshop on Efficient Deep Learning, CVPR 2018.
 - Program Chair, Workshop on Computer Vision for Autonomous Driving, ICCV 2013.
 - Tutorial on “Human Sensing”, PAVIS school on Computer Vision and Pattern Recognition, Geneva, October 2012. (15 hours).
 - Tutorial on “Facial Expression Analysis”, CVPR 2012, in conjunction with Looking at People, Providence, June 2012. (1 hour).
 - Tutorial on “Component Analysis for Human Sensing”, AERFAI Summer School on Pattern recognition in Multimodal Interaction, Spain, Vigo June 2012. (4 hours)
 - Organize tutorial on “Component Analysis for Computer Vision and Pattern Recognition”, summer school in Australia 2011. (4 hours)
 - Local Area Chair for International Conference on Computer Vision 2011.
 - Workshop Chair in the International Conference on Machine Intelligence 2011.
 - Workshop Chair in the International Conference on Multi-modal Interfaces 2011.
 - Co-chair of a special seminar on “Probabilistic Methods for Perceiving, Learning and Reasoning about Everyday Activities”, Germany, June 2010.
 - Publicity Chair for Face and Gesture 2008.

- Organize tutorial “Component Analysis for Pattern Recognition”, International Conference on Pattern Recognition, August 2008.
- Organize tutorial “Extended linear and multi-linear methods for multimodal signal processing”, International Conference on Multimedia and Expo, May 2007.
- Organize tutorial on “Component Analysis for Computer Vision”, European Conference on Computer Vision 2006.
- Co-organize tutorial on “Linear and Multilinear (Tensor) Methods for Vision, Graphics, and Signal Processing”, Computer Vision and Pattern Recognition, June 2006.
- Co-organize 1st workshop on “Component Analysis Methods for Classification, Clustering, Modeling and Estimation Problems in Computer Vision”, jointly with IEEE Computer Vision and Pattern Recognition, June 2007.
- Co-organize workshop on “Learning, Representation and Context for Human Sensing in Video”, jointly with IEEE Computer Vision and Pattern Recognition, June 2006.

Area Chair:

- Area Chair for IEEE Computer Vision and Pattern Recognition 2022.
- Area Chair for International Conference on Computer Vision 2021.
- Area Chair for IEEE Computer Vision and Pattern Recognition 2020.
- Area Chair for IEEE Automatic Face and Gesture Recognition 2019.
- Area Chair for European Conference on Computer Vision 2018.
- Area Chair for IEEE Computer Vision and Pattern Recognition 2017.
- Area Chair for IEEE Automatic Face and Gesture Recognition 2017.
- Area Chair for European Conference on Computer Vision 2016.
- Area Chair for IEEE Computer Vision and Pattern Recognition 2016.
- Area Chair for IEEE Automatic Face and Gesture Recognition 2015.
- Area Chair for European Conference on Computer Vision 2014.
- Area Chair for IEEE Computer Vision and Pattern Recognition 2014.
- Area Chair for IEEE Automatic Face and Gesture Recognition 2013.
- Area Chair for Asian Conference on Computer Vision 2012.
- Area Chair for IEEE Automatic Face and Gesture Recognition 2011.
- Area Chair for International Conference on Computer Vision 2011.
- Area Chair for IEEE Computer Vision and Pattern Recognition 2010.

Program Committee Member, Conferences:

- IEEE Computer Vision and Pattern Recognition (2003-2015).
- IEEE International Conference on Computer Vision (2005, 2007, 2009, 2011, 2013, 2015).
- IEEE Winter conference on Applications and Computer Vision, 2014.
- ICRA (2011, 2012, 2015).
- AAAI 2015.
- International Conference on Biometrics, (2014, 2015).

- The 18th International Symposium on Wearable Computers 2014.
- European Conference on Computer Vision (2002, 2004, 2006, 2008, 2010, 2012).
- Neural Information Processing Systems (2004, 2010, 2011, 2013, 2014).
- 22nd IEEE International Symposium on Robot and Human Interactive Communication 2013
- IEEE Fifth International Conference on Biometrics: Theory, Applications and Systems 2012.
- International Conference on Multimodal Interfaces (2012).
- Biometrics: Theory, Applications and Systems 2013.
- SIGGRAPH (2002, 2011, 2012, 2013).
- SIGGRAPH Asia (2011).
- Eurographics (2012).
- ACM Multimedia (2011, 2012).
- International Conference on Machine Learning (2007).
- International Conference on Automatic Face and Gesture Recognition (2002, 2008).
- International Conference on Pattern Recognition (2008, 2010, 2012).
- IEEE International Conference on Image Processing (2003, 2007).
- IEEE International Conference on Multimedia and Expo (2002).
- Iberian Conference on Pattern Recognition and Image Analysis (IbPRIA) (2011, 2013).
- Indian Conference on Vision, Graphics, and Image Processing (2012).

Program Committee Member, Workshop:

- IEEE Workshop On Analysis and Modeling of Faces and Gestures, Boston, June 2015
- 1st Workshop on User-Centred Computer Vision, Singapore, November 2014.
- 2^{on} Workshop VISART: Where Computer Vision Meets Art, Zurich 2014.
- 5th workshop on Human Behavior Understanding, 2014
- ChaLearn Workshop on Looking at People 2014
- 4th International Workshop on Human Behavior Understanding, Barcelona, October 2013
- 2^{on} International Workshop on Context Based Affect Recognition CBAR, Geneva 2013
- 3rd Workshop on Gesture Recognition, Sydney, December 2013.
- 1st ACM MM Workshop on Multimedia Indexing and Information Retrieval for Healthcare, October 2013.
- 3rd International Workshop on Human Behavior Understanding, July 2013.
- AAI-13 Robotics (Robotics Track), July 2013.
- IEEE Workshop on the Applications of Computer Vision, January 2013.
- Workshop on User-Centred Computer Vision, January 2013.
- 2^{on} Workshop on Context Based Affect Recognition, held in conjunction with SocialCom, October 2012.

- 2^{on} International Workshop on Benchmarking Facial Image Analysis Technologies (BeFIT), October 2012.
- 2^{on} Workshop on Egocentric Vision, Providence, June 2012.
- 2^{on} Workshop on Gesture Recognition (CVPR), Providence, June 2012.
- VISART: Where Computer Vision Meets Art, October 2012.
- 2^{on} International Audio/Visual Emotion Challenge and Workshop, October 2012.
- IEEE Workshop on the Applications of Computer Vision, January 2012.
- Workshop on Human Computer Interaction in Computer Vision, November 2011.
- Machine Learning for Affective Computing (MLAC), October 2011.
- 2^{on} International Workshop on Sign, Gesture and Activity, November 2011
- 1st International Audio/Visual Emotion Challenge and Workshop, October 2011.
- 4th IEEE Workshop on Human Communicative Behavior Analysis, June 2011.
- 16th Vision, Modeling, and Visualization (VMV11) Workshop, October 2011.
- 6th IEEE Workshop on Human Computer Interaction: Real-Time Vision Aspects of Natural User Interfaces, November 2011.
- 3rd Workshop on Use of Context in Video Processing, November 2011.
- 1st Workshop on Benchmarking Facial Image Analysis Technologies, November 2011.
- Workshop on Gesture Recognition, June 2011.
- Workshop on Facial Expression Recognition and Analysis Challenge (FERA2011), March 2011.
- Workshop on Person-Oriented Vision (POV), January 2011.
- Workshop on Sign, Gesture and Activity, September 2010.
- Workshop on Subspace Methods, November 2010.
- 3rd IEEE Workshop on Human Communicative Behavior Analysis, June 2010.
- Workshop on Computer Vision for Human-Robot Interaction, June 2010.
- Workshop on Structured Models in Computer Vision, June 2010.
- Workshop on Analysis and Modeling of Faces and Gestures, June 2010.
- 1st International Workshop on Situational Awareness for Autonomous and Mobile Platforms, May 2010.
- 2^{on} workshop on the Use of Context in Vision Processing (UCVP), November 2009.
- 2^{on} IEEE International Workshop on Subspace Methods, September 2009.
- Workshop on e-Heritage and Digital Art Preservation, September 2009.
- IEEE Workshop on Applications of Computer Vision, December 2009.
- 2^{on} IEEE Workshop on CVPR for Human Communicative Behavior Analysis, September 2009.
- 1st International Workshop on Online Pattern Recognition and Machine Learning Techniques for Computer Vision Applications, January 2008.
- Computer Vision for Biomedical Image Applications: Current Techniques and Future Trends, October 2005.
- Workshop on Statistical Learning in Computer Vision at ECCV, May 2004.

- Enabling Technologies for Homeland Security Conference at Great Lakes Photonics Symposium, June 2004.

Doctoral Consortium:

- IEEE Computer Vision and Pattern Recognition (2010, 2011, 2012, 2013)
- International Conference on Computer Vision (2021)
- IEEE Automatic Face and Gesture Recognition (2011, 2015)

Other committees:

- Best paper award AFGR 2013.
- Judge for the ChaLearn Gesture Challenge. June 2012.

University Services

Organizing the weekly CMU Vision seminar 2019-Present

Chair of the admissions committee for the professional M.S. on Computer Vision 2014.

Faculty Senate for RI (2010-2011).

Graduate admission committee for RI (2007-2008, 2008-2009, 2009-2010, 2019-2020, 2020-2021, 2021-2022).

Hiring committee for RI (2006-2007).

Contact person for the CMU Talentia program.

Co-responsible of the CMU-Portugal program at the Robotics Institute.

Editorial

Special issue on deep learning for face analysis. *IJCV*, 127, 2019.

Special issue on Human Emotion Analysis. *IEEE Transactions on Image Processing*, 2018.

Associate Editor on *IEEE Transactions on Pattern Analysis and Machine Intelligence* (Feb. 2012-Feb. 2016)

Reviewing

Reviewed journal papers for:

IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) (47), *IEEE Transactions on Affective Computing* (4), *Pattern Recognition* (10), *International Journal of Computer Vision* (13), *Image and Vision Computing* (4), *IEEE Trans. SMC- Part B* (3), *Computer Vision and Image Understanding* (3), *IEEE Transactions on Information Forensics and Security* (2), *IEEE Transactions on Neural Networks* (4), *Data Mining and Knowledge Discovery* (2), *Journal of Machine Learning Research* (2), *Elcevia* (2), *Neurocomputing* (1), *Neural Computation* (1), *Artificial Intelligence* (1), *Image Communication Journal* (1), *Journal of Pattern Recognition and Artificial Intelligence* (1), *Journal of Computational and Graphical Statistics* (1).

Reviewed several chapters on *Adaptive Blind Signal and Image Processing*. John Wiley and Sons. 2002. Reviewed *Vision Based Interaction*. Morgan and ClayPool Publishers. 2013.

Foreword for book "Multi-modal challenges in gesture recognition", S. Escalera, V. Athitsos and I. Guyon (Eds).

Reviewed grant application for:

- National Science Foundation 2021 (three panels).
- National Science Foundation 2020.
- National Science Foundation 2014.
- National Science Foundation 2013.
- Comunicaciones y Electronica del Fondo para la Investigacin Cientfica y Tecnologica (FONCYT). Argentina agency, 2012.
- National Science Foundation, IIS-2012.
- National Science Foundation, CDI-2009.
- European Projects. Objective 1.5 Internet and 3D media, 2009.
- Israel Science Foundation 2008, 2009.
- Agencia de Gestio i Ajuts Universitaris i de Recerca (AGUR), Catalonia Research Agency (2005, 2007).

Reviewed promotions: Six cases.

Reference letters: 143 (different people).

**Grants
and Gifts**

Gift from Apple, October 2021.

Principal Investigator. "Universal Face Model", Facebook, 09/1/2021-9/1/2022.

Co-Investigator (PI: Alex Hauptmann). "Deep Intermodal Video Analytics (DIVA)", IARPA, 09/1/2017-09/01/2020.

Co-Principal Investigator. "SCH: EXP: Monitoring Motor Symptoms in Parkinson's Disease with Wearable Devices", National Science Foundation, 9/1/2016-7/31/2020.

Principal Investigator. "RI:Small: Supervised Descent Method and its applications to Computer Vision (and beyond)", Robust Intelligence program (NSF), 09/1/2016-09/1/2019.

Principal Investigator. "STTR Phase I: Wearable System for Mining Parkinson's Disease Symptom States in an Ambulatory Setting", NSF, STTR, 01/1/2016-08/1/2017.

Principal Investigator. "Deep Semantic Component Analysis", Google Research Award.

Co-Principal Investigator. "SCH: INT: Collaborative Research: Learning and Sensory-based Engagement, Arousal and Self-Efficacy (EASE) modeling for Adaptive Web-Empowerment Trauma Treatment", National Science Foundation, 9/1/2014-7/31/2018.

Principal Investigator. "Advanced Driver Monitoring System", TRAFFIC 21, 01/1/2016-01/1/2017.

Principal Investigator. "Emotional Detection from Wearable Sensors", Sony, 10/1/2016-08/31/2019.

Principal Investigator. "Vital Responder: Towards a Wearable Vital Signs, Ambiance Sensing and Location Monitoring Product for First Response Professionals", ERI- CMU/Portugal Program, 09/1/2014-08/31/2019.

Co-Principal Investigator. “Modeling the Dynamics of Communication and Development”, National Institutes of Health R01 GM105004, 8/1/2013-7/31/2017.

Principal Investigator. Gift from Sony 2015.

Principal Investigator. “Automated Identity Masking”, DTFH61-14-C-00001, Federal Highway Administration, 04/1/2014-04/31/2015.

Co-Principal Investigator. “Solve it or Ignore it? The Challenge of Alignment Distortion and Creating Next Generation Automatic Facial Expression Detection”, Australian Research Council (ARC).

Co-Principal Investigator. “A Wearable System for Home-monitoring of Chronic Movement Disorders: Cost-effective Solution to Frequent Clinic Visits”, \$270K, Highmark, 07/1/2013-81/01/2015.

Gift from Adobe, \$10K, October 2013.

Principal Investigator. “Activity Recognition from Kinect”, \$150K, Samsung, 04/1/2013-12/31/2013.

Principal Investigator. “Human Pose and Motion Behavior Pattern Analysis”, \$135K, Samsung, 04/1/2012-12/31/2012.

Principal Investigator. “RI:Small: Clustering, Classification and Alignment of Time Series for Human Sensing”, \$450K, Robust Intelligence program (NSF), 09/1/2011-09/1/2014.

Co-Principal Investigator. “GM-CMU Vehicular Information Technology Collaborative Research Lab”, General Motors, \$90K/year, 01/01/2009-01/01/2014.

Co-Principal Investigator (PI: Jeff Cohn). “Automatic Facial Image Analysis”, NIMH RO1 NH096951, 04/1/2012-04/30/2017.

Principal Investigator. “Grand Challenge Data Collection”, Quality of Life Technology Center (PI: Takeo Kanade), ERC, NSF, 04/1/2008-04/30/2012.

Co-Investigator (PI: Alex Hauptmann). “Multimedia Event Detection (ALADDIN)”, IARPA, 04/1/2011-04/30/2012.

Gift from Personal Health Recording for Quality of Life, \$100K, December 2011.

Co-Principal Investigator. “Automated Methods to support the detection of depression in dementia”, NIH: 1RC1MH090021-01, \$998,721, 09/1/2009-09/1/2011..

Co-Principal Investigator. “CPS-Medium: Monitoring Human Performance with Wearable Accelerometers”, NSF:0931595, \$1,206,078, 10/1/2009-10/1/2012.

Gift from The Humane Society of the United States, \$60K, January 2009.

Principal Investigator. “Nano-Optic based Multi-Spectral CMOS Image Sensor Development”, ClairPixel, \$150K, 05/1/2009-04/30/2012.

Co-Investigator. “Facial Expression Analysis by Computer Processing”, National Institute of Mental Health, 04/1/2007-04/30/2011.

Co-Principal Investigator and PI at CMU (PI-Jeff Cohn, Upitt). “Automatic Facial Expression Recognition System”, Technology Support Working Group, \$375K, 03/1/2009-03/1/2010.

Co-Principal Investigator and PI at CMU. “Machine Learning Approaches to Hot Flash Detection”, American Federation for Aging Research, \$25K, 10/1/2008-6/1/2009.

Principal Investigator. “Computer Assisted System to Increase Speed and Reliability of Manual FACS coding”, Reallear, LLC and HSA, \$900K, 8/1/2007-8/1/2009.

Principal Investigator. “FACENORM: Normalization Plug-In For Improved Face Recognition of Non-Cooperative Individuals”, National Institute of Justice, \$250K, 7/1/2006-7/1/2007.

Gift from Department of Orthopaedic Surgery, \$10K, September 2005.

Co-Principal Investigator. “The Virtual Announcer”. Spanish PROFIT Grant, \$30K, 09/01/2003-09/01/2004.

Co-Principal Investigator. “A Vision-based Driver Fatigue Detection”, Spanish PROFIT Grant, \$15K, 09/01/2003-09/01/2004.

Books

F. De la Torre.

Component Analysis.

Gerard Medioni’s and Sven Dickinson’s computer vision series. Morgan and Claypool 2011. In preparation.

Book Chapters

- [1] R. Cabral, F. De la Torre, J. P. Costeira and A. Bernardino. “Handbook of Robust Low-Rank and Sparse Matrix Decomposition: Applications in Image and Video Processing”, Handbook of Robust Low-Rank and Sparse Matrix Decomposition: Applications in Image and Video Processing, 2017
- [2] M. Hoai and F. De la Torre. “Structured Prediction for Event Detection”, MIT Press volume on Advanced Structured Prediction, 2014.
- [3] J. F. Cohn and F. De la Torre(In press). “Automated face analysis for affective computing”, In R. A. Calvo, S. K. D’Mello, J. Gratch and A. Kappas (Eds.), Handbook of affective computing. New York, NY: Oxford.
- [4] F. De la Torre and J. F. Cohn, “Facial Expression Analysis”, Guide to Visual Analysis of Humans: Looking at People. Springer 2011.
- [5] F. De la Torre, “A Unification of Component Analysis Methods”, Handbook of Pattern Recognition and Computer Vision, 4th edition, pp. 3-22, C. H. Chen (Ed.). World Scientific Publishing Co, October 2009.
- [6] R. Gross, L. Sweeney, J. Cohn, F. De la Torre and S. Baker, “Face De-Identification”, Protecting Privacy in Video Surveillance, pp. 129-146, Senior, Andrew (Ed.), Springer, April 2009.

- [7] F. De la Torre and T. Kanade, “Discriminative Cluster Analysis”. Theory and Novel Applications of Machine Learning, pp. 69-80, M. Er and Y. Zhou (Eds), January 2009.
- [8] E. Garcia-Cuesta, F. De la Torre, and A. J. de Castro. “Machine Learning Approaches for the Inversion of the Radiative Transfer Equation”. Advances in Computational Algorithms and Data Analysis Series: Lecture Notes in Electrical Engineering, S. Ao, B. Rieger and S. Chen (Editors), Vol. 14, Springer 2008.

Journal Papers

- [9] C Cao, V Agrawal, F De La Torre, L Chen, J Saragih, T Simon, Y Sheikh, ” Real-time 3D neural facial animation from binocular video”, *ACM Transactions on Graphics (TOG)* 40 (4), 1-17
- [10] X. Xu, H. Chen, F. Moreno-Noguer, L. Jeni, F. De la Torre, “ 3d human shape and pose from a single low-resolution image with self-supervised learning” *Pattern Analysis and Machine Intelligence*, 2021
- [11] D. Tome, T. Alldieck, P. Peluse, G. Pons-Moll, L. Agapito, H. Badino, and F. De la Torre, “SelfPose: 3D Egocentric Pose Estimation from a Headset Mounted Camera”, *Pattern Analysis and Machine Intelligence*, October 2020.
- [12] R. San-Segundo, A. Zhang, A. Cebulla, S. Panev, G. Tabor, K. Stebbins, R. Massa, A. Whitford, F. De la Torre, and J. Hodgins. “Parkinsons Disease Tremor Detection in the Wild Using Wearable Accelerometers”, *Sensors* 2020, 20(20)
- [13] J. Han, Y. Yang, D. Zhang, D. Huang, D. Xu, and F. De La Torre, “Weakly-Supervised Learning of Category-specific 3D Object Shapes”, *Pattern Analysis and Machine Intelligence*, October 2019.
- [14] J. Vongkulbhisal, R. Cabral, F. De la Torre and J. Paulo Costeira, “Discriminative Optimization: Theory and Applications to Computer Vision Problems”, *Pattern Analysis and Machine Intelligence*, vol. 41, no. 4, April 2019.
- [15] R. San-Segundo, H. Navarro, R. Torres, F. De la Torre, and J. Hodgins, ”Increasing robustness in the detection of freezing of gait in Parkinsons disease”, *Electronics*, vol. 8, no. 2, 119, January 2019.
- [16] W. Chu, F. De la Torre, and J. Cohn, “Learning facial action units with spatiotemporal cues and multi-label sampling”, *Image and Vision Computing (IVC)*, vol. 81, pp. 1-14, January 2019.
- [17] S. Panev, F. Vicente, F. De la Torre, and V. Prinet, ”Road Curb Detection and Localization With Monocular Forward-View Vehicle Camera”, *IEEE Transactions on Intelligent Transportation Systems*, vol. 20, no 9. pp. 3568-3584, December 2018.
- [18] M. A. Bautista, O. Pujol, F. De la Torre, and S. Escalera. “Error-Correcting Factorization”, *Pattern Analysis and Machine Intelligence*, vol. 40, no 10. pp. 2388-2401, October 2017.

- [19] E. Snchez-Lozano, G. Tzimiropoulos, B. Martinez, F De la Torre, M Valstar. “A functional regression approach to facial landmark tracking”, *Pattern Analysis and Machine Intelligence*, vol. 40, no 9. pp. 2037-2050, August 2017.
- [20] W. Chu, F. De la Torre, J. F Cohn and, D. S Messinger. “A Branch-and-Bound Framework for Unsupervised Common Event Discovery”, *International Journal on Computer Vision*, vol. 123, no. 3, pp. 372-391, 2017.
- [21] W.-S. Chu, F. De la Torre and J. F. Cohn, “Selective Transfer Machine for Personalized Facial Action Unit Detection”, *Accepted in Pattern Analysis and Machine Intelligence*, vol. 39, no. 3, pp. 529-545, March 2017.
- [22] F. Zhou, and F. De la Torre. “Spatio-temporal Matching for Human Detection in Video”, *accepted in Pattern Analysis and Machine Intelligence*, vol. 38, no. 8, pp. 1492-1504, 2016.
- [23] J. Zeng, W.-S. Chu, F. De la Torre, J. F. Cohn, and Z. Xiong, “Confidence Preserving Machine for Facial Action Unit Detection”, *IEEE Transactions on Image Processing*, vol. 25, no. 10, pp. 4753 - 4767, July 2016.
- [24] F. Zhou, and F. De la Torre. “Factorized Graph Matching”, *accepted in Pattern Analysis and Machine Intelligence*, vol. 38, no. 9, pp. 1774-1789, 2016.
- [25] L. Leon, W.-S. Chu, F. De la Torre and J. F. Cohn , “Cascade of Tasks for Facial Expression Analysis”, *Accepted for publication in Computer Vision and Image Understanding*, 2016.
- [26] K. Zhao, W. -S. Chu, F. De la Torre, J. F. Cohn, H. Zhang, “Joint Patch and Multi-label Learning for Facial Action Unit and Holistic Expression Recognition”, *Accepted in IEEE Transactions on Image Processing*, vol. 25, no. 8, pp. 3931-3946, August 2016
- [27] J. Zhao, L. Wang, R. Cabral, and F. De la Torre, “Feature and Region Selection for Visual Learning”, *Accepted in IEEE Transactions on Image Processing*, , vol. 25, no. 3, pp. 1084-1094, March 2016 .
- [28] F. Zhou and F. De la Torre. “Canonical Time Warping”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 38, no. 2, pp. 279-294, 2016
- [29] D. Huang, R. S. Cabral, and F. De la Torre, “Robust Regression”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 38, no. 2, pp. 363-375, 2016.
- [30] R. S. Cabral, F. De la Torre, J. P. Costeira and A. Bernardino. “Matrix Completion for Weakly-supervised Multi-label Image Classification”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 37, no. 1, pp. 121-135, 2015.
- [31] J. Carlson, S. Das, F. De la Torre, J. Hodgins “Assessment Of Movement Patterns During Intubation Between Novice And Experienced Providers Using Mobile Sensors: A Preliminary, Proof Of Concept Study”, *BioMed Research International*, 2015

- [32] F. Vicente, Z. Huang, X. Xiong, F. De la Torre, W. Zhang and D. Levi, “Driver Gaze Tracking and Eyes Off the Road Detection System”, *IEEE Intelligent Transportation Systems Transactions and Magazine*, vol. 16, no. 4, pp. 2014-2027, 2015.
- [33] K. Abou-Moustafa, F. De la Torre, and P. F. Ferrie. “Pareto models for discriminative multiclass linear dimensionality reduction”, *Pattern Recognition*, vol. 48, no. 5, pp. 1863-1877, 2015.
- [34] J. M. Girard, J. F. Cohn, and F. De la Torre. “Estimating smile intensity: A better way”, *Pattern Recognition Letters*, Vol. 66, pp. 13-21, 2015.
- [35] Learning discriminative localization from weakly labeled data M. Hoai, L. Torresani, F. De la Torre, and C. Rother *Pattern Recognition*, 47(3), 1523-1534, 2014.
- [36] A. Frisch, S. Das, J. C. Reynolds, F. De la Torre, J. K. Hodgins, and J. N. Carlson. “Analysis of smart phone video footage classifies chest compression rate during simulated CPR”, *The American Journal of Emergency Medicine* Vol. 32, pp. 1125-1147, 2014.
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- [103] F. De la Torre and O. Vinyals. “Parameterized Kernels for Support Vector Machine Classification”, *2nd International Conference on Computer Vision Theory and Applications (VISAPP)*, pp. 116–122, Barcelona, March 2007.
- [104] F. De la Torre, J. Campoy, J. Cohn and T. Kanade. “Simultaneous Registration and Clustering for Temporal Segmentation of Facial Gestures from Video”, *2nd International Conference on Computer Vision Theory and Applications (VISAPP)*, pp. 110–115, Barcelona, March 2007.
- [105] E. Lopez-Vidriero, R. Costic, F. De la Torre Frade, F.H. Fu, and M. Rodosky. “Biomechanical Evaluation of Drilling versus Punching Before Placement of Anchors for Rotator Cuff Surgery”, *Arthroscopy Association of North America, Annual Meeting*, San Francisco, April, 2007.
- [106] E. Lopez-Vidriero, R. Costic, F. De la Torre Frade, F.H. Fu, and M. Rodosky. “Structural Properties of Anchors Placement for Rotator Cuff Surgery in Different Locations”, *Arthroscopy Association of North America, Annual Meeting*, San Francisco, April, 2007.
- [107] F. De la Torre and T. Kanade. “Discriminative Cluster Analysis”, *International Conference on Machine Learning (ICML)*, pp. 241–248. Pittsburgh, June 2006.
- [108] S. Lucey, I. Matthews, C. Hu, A. Zara, F. De la Torre, and J. Cohn. “AAM Derived Face Representations for Robust Facial Action Recognition”, *International Conference on Automatic Face and Gesture Recognition (AFGR)*, pp. 155-160, Southampton, April 2006.
- [109] C. Valles, F. De la Torre, M. Veloso and T. Kanade. “Automatic Clustering of Faces in Meetings”, *International Conference on Image Processing (ICIP)*, Atlanta, April 2006.
- [110] F. De la Torre and T. Kanade. “Multimodal Oriented Discriminant Analysis”. *International Conference on Machine Learning (ICML)*, Bonn, August 2005.
- [111] F. De la Torre, R. Gross, S. Baker and V. Kumar “Representational Oriented Component Analysis (ROCA) for Face Recognition with One Sample Image per Training Class”, *IEEE Proc. Computer Vision and Pattern Recognition (CVPR)*, San Diego, June 2005.
- [112] F. De la Torre, C. Vallespi, P. E. Rybski, M. Veloso, and B. Browning. “Learning to Track People in Omnidirectional Video”, *International Conference on Robotics and Automation (ICRA)*, Barcelona, May 2005.

- [113] P. Rybski, S. Banerjee, F. De la Torre, C. Vallespi, A. Rudnicky, and M. Veloso. “Segmentation and Classification of Meetings using Multiple Information Streams”, *Proceedings of International Conference on Multimodal Interfaces (ICMI)*, pp. 335–336, State College, PA, October 2004.
- [114] F. De la Torre and T. Kanade. “Oriented Discriminant Analysis”, *British Machine Vision Conference (BMVC)*, London, September 2004.
- [115] F. De la Torre, J. Casoliva, and J. Cohn. “Learning 3D Appearance Models from Video”, *International Conference on Automatic Face and Gesture Recognition (AFGR)*, Seoul, May 2004.
- [116] P. E. Rybski, F. De la Torre, R. Patil, C. Vallespi, M. Veloso, and B. Browning. “CAMEO: The Camera Assisted Meeting Event Observer”, *International Conference on Robotics and Automation (ICRA)*, New Orleans, May 2004.
- [117] F. De la Torre, J. Carlos, and E. Martínez. “Subspace Eyetracking for Driver Warning”, *International Conference on Image Processing (ICIP)*, Barcelona, September 2003.
- [118] J. Melenchón, F. De la Torre, I. Iriondo, F. Alías, E. Martínez, and L. Vicent. “Text to Visual Synthesis with Appearance Models”, *International Conference on Image Processing (ICIP)*, Barcelona, September 2003.
- [119] F. De la Torre, and M. J. Black. “Robust Parameterized Component Analysis: Theory and applications to 2D facial modeling”, *European Conf. on Computer Vision (ECCV)*, Copenhagen, Denmark, May 2002.
- [120] F. De la Torre, and M. J. Black. “Dynamic coupled component analysis”, *IEEE Proc. Computer Vision and Pattern Recognition (CVPR)*, Kauai, Hawaii, Dec. 2001.
- [121] F. De la Torre, and M.J. Black. “Robust Principal Component Analysis for Computer Vision”, *Int. Conf. on Computer Vision (ICCV)*, Vancouver, BC, Vol. I, pp. 362–369.
- [122] F. De la Torre. “Cara a Cara con la tecnología creativa. Aprendizaje automático de un modelo personal facial para la detección, reconocimiento, seguimiento y animación”, *I Conference on creativity and society*, Barcelona, April 2001.
- [123] H. Sidenbladh, F. De la Torre, M. J. Black. “A framework for modeling the appearance of 3D articulated figures”, *IEEE International Conference on Automatic Face and Gesture Recognition (AFGR)*, Grenoble, France, March 2000, pp. 368–375.
- [124] F. De la Torre, Y. Yacoob, L. Davis. “A Probabilistic Framework for Rigid and Non-Rigid Appearance based Tracking and Recognition”, *IEEE International Conference on Automatic Face and Gesture Recognition (AFGR)*, pp. 491-498, Grenoble, France, March 2000.
- [125] F. De la Torre, J. Vitrià, P. Radeva and J. Melenchón. “EigenFiltering for Flexible Eigen-tracking”, *15th International Conference on Pattern Recognition (ICPR)*, pp. 1118-1121, Barcelona, September 2000.

- [126] F. De la Torre, X. Jové, E. Martínez and LL. Vicent. “Appearance Based Tracking with switching”, *2on Congrés Català d’Inteligència Artificial*, Girona, Spain, October 1999.
- [127] L. Safont, E. Martínez, X. Jové, F. de la Torre. “Reconstrucció tridimensional del ter proximal del fèmur a partir de contorns actius”, *2on Congrés Català d’Inteligència Artificial*, Girona, Spain, October 1999.
- [128] F. De la Torre, S. Gong and S. McKenna. “View-based Adaptive Affine Alignment”, *European Conference on Computer Vision (ECCV)*, pp. 828-842, Freiburg, Germany, June 1998.
- [129] F. De la Torre, S. Gong and S. McKenna. “View Alignment with Dynamically Updated Affine Tracking”, *Proceeding Face and Gesture Recognition (AFGR)*, pp. 510-515, Nara, Japan, April 1998.
- [130] F. De la Torre, E. Martínez, E. Santamaría, J.A. Morán. “Moving object detection and tracking system: a real time implementation”, *Proceedings of the Symposium on Signal and Image Processing (GRETSI)*, pp. 375-378, Grenoble, France 1997.
- [131] E. Martínez, X. Jové, F. De la Torre, E. Santamaría. “Unsupervised morphological segmentation of objects in contact”, *Proceedings of the Symposium on Signal and Image Processing (GRETSI)*, pp. 1379-1382, Grenoble, France 1997.
- [132] J.A.Morán, F. De la Torre, E. Santamaría. “An efficient algorithm for detecting and tracking moving targets”, *Digital Signal Processing (DSP)*, pp. 304-308, Santorini, Greece 1997.

**Refereed
Workshop**

Publications

- [95] A. Pumarola, V. Goswami, F. Vicente, F. De la Torre, and F. Moreno-Noguer, ” Unsupervised Image-to-Video Clothing Transfer”, Proceedings of the IEEE International Conference on Computer Vision Workshops.
- [196] X. Perez-Sala, F. De la Torre, L. Igual, S. Escalera, and C. Angulo, “ Subspace Procrustes Analysis”, ECCV Workshop on ChaLearn Looking at People, 2014
- [197] L. Jeni, J. Girard, J. F. Cohn and F. De la Torre. “ Continuous AU Intensity Estimation using Localized, Sparse Facial Feature Space”, 2nd International Workshop on Emotion Representation, Analysis and Synthesis in Continuous Time and Space (EmoSPACE), April 2013.
- [198] D. Huang , K. Meyers , S. Henry , F. De la Torre and C. Horn. “Non-rigid Tracking of Musk Shrews in Video for Detection of Emetic Episodes.”, the 3rd International Workshop on Machine Learning for Vision-based Motion Analysis. In conjunction with CVPR, June 2011.
- [199] Z. Zhang, M. Kim, F. De la Torre and W. Zhang. “A Real-time System for Head Tracking and Pose Estimation for Driver’s Alertness”, Workshop on Signal, Gesture and Activity. In conjunction with ECCV, May 2010.

- [200] Y. Shi, M. Nguyen, F. De la Torre, A. Smailagic and D. P. Siewiorek. “SVM for Stress Inference”, *Second International Symposium on Quality of Life Technology*, June 2010.
- [201] Y. Shi, C. Chen, F. De la Torre and H. Wactlar. “Coupled State-Space Models for Tracking People through Camera Networks”, *Second International Symposium on Quality of Life Technology*, June 2010.
- [202] L. Igual and F. De la Torre. “Continuous Procrustes Analysis to Learn 2D Shape Models from 3D objects ”, *Third Workshop on Non-Rigid Shape Analysis and Deformable Image Alignment*, June 2010.
- [203] R. Nicolas, D. Vernet, E. Golobardes, A. Fornells, F. De la Torre and S. Puig. “Applying Distance Metric Learning in a Collaborative Melanoma Diagnosis System with Case-Based Reasoning”, *Workshop on Case-Based Reasoning, in conjunction with British Computer Society conference on artificial intelligence and its applications*, December 2009.
- [204] F. Zhou, F. De la Torre and J. Hodgins. “Aligned Cluster Analysis for Temporal Segmentation”, *Workshop on Temporal Segmentation: perspectives from statistics, machine learning, and signal processing, in conjunction with NIPS*, December 2009.
- [205] G. Roig, F. De la Torre and X. Boix. “Optimal Feature Selection for Subspace Image Matching”, *2nd IEEE International Workshop on Subspace Methods, in conjunction with ICCV*, September 2009.
- [206] N. Brunet, F. De la Torre and F. Perez. “Learning Good Features for Active Shape Models”, *2nd IEEE International Workshop on Subspace Methods, in conjunction with ICCV*, September 2009.
- [207] E. H. Spriggs, F. De la Torre, and M. Hebert. “Temporal Segmentation and Activity Classification from First-person Sensing”, *IEEE Workshop on Egocentric Vision*, in conjunction with CVPR, June 2009.
- [208] F. De la Torre, J. Hodgins, J. Montano and S. Valcarcel. “Detailed Human Data Acquisition of Kitchen Activities: the CMU-Multimodal Activity Database (CMU-MMAC)”, *CHI 2009 Workshop. Developing Shared Home Behavior Datasets to Advance HCI and Ubiquitous Computing Research*, April 2009.
- [209] J. Gonzalez, R. Murthi, F. De la Torre. “Bilinear Active Appearance Models”, *Workshop on Non-rigid Registration and Tracking through Learning*, in conjunction with ICCV, October 2007.
- [210] R. Gross, L. Sweeney, F. De la Torre, S. Baker. “Model-Based Face De-Identification”, *IEEE Workshop on Privacy Research In Vision*, in conjunction with CVPR, June 2006.
- [211] F. De la Torre, C. Vallespi, P. Rybski, M. Veloso and T. Kanade. “Multiple Face Recognition from Omnidirectional Video”, *IEEE Workshop on Learning in Computer Vision and Pattern Recognition*, June, 2005.
- [212] F. De la Torre. “Automatic Learning of Appearance Face Models”, *Workshop on Recognition, Analysis and Tracking of Faces and Gestures in real-time systems*, in conjunction with ICCV, October 2001.

Unrefereed conferences

- [213] S. Das, J. Carlson, F. De la Torre, A. Fisch, F. Guyette, J. K. Hodgins and D. M. Yealy, "A novel video content analysis system for interactive video laryngoscopy", National Association of Emergency Medicine Service Professional (NAEMSP) Annual Meeting, Bonita Springs, FL, 2013
- [214] J. Carlson, S. Das, F. De la Torre, C. Callway, P. Phrampus and J. Hodgins, "Motion Capture Measures variability in Laryngoscopic Movement During Endotracheal Intubation: A Preliminary Report", poster presentation at the national meeting for the National Association of EMS Physicians. Tucson AZ, January 2012
- [215] D. Huang, K. Meyers, F. De la Torre, and C.C. Horn, "Development of a computer algorithm for automatic detection of cancer chemotherapy-induced vomiting in a small animal model, musk shrews". UPCI retreat.
- [216] D. Huang, K. Meyers, F. De la Torre, and C.C. Horn, "Automatic detection of cancer chemotherapy-induced vomiting in musk shrews," The Society for the Study of Ingestive Behavior 2009
- [217] R. C. Thurston , J. Hernandez , J. M. Del Rio, F. De la Torre, K. A. Matthews. Improving the physiological measurement of hot flashes with support vector machine. Invited poster presentation. American Federation for Aging Research Annual Meeting. Santa Barbara, CA. September 2008.

Technical Reports

- (not above)
- [218] Z. Harchaoui, F. de la Torre, J. Cohn. Multi-Label Classification with Correlated Labels CMU Technical Report, October 2010
 - [219] J. Hernandez Rivera, Z. Harchaoui, F. de la Torre. Instance-selecting regularization penalty for supervised image classification CMU Technical Report CMU-RI-TR-10-42, October 2010
 - [220] F. De la Torre. "A Least-Squares Unified View of PCA, LDA, CCA and Spectral Graph Methods", *tech. report CMU-RI-TR-08-29*, Robotics Institute, Carnegie Mellon University, May, 2008.
 - [221] F. De la Torre. "Coordinating Component Analysis", *tech. report CMU-RI-TR-06-08*, Robotics Institute, Carnegie Mellon University, February, 2006.

Ph.D. Advising Carnegie Mellon University

Minh Hoai Nguyen. "Segment-based SVMs for Time Series Analysis". Carnegie Mellon University. December 2011.

Ekaterina Spriggs (co-advised with M. Hebert). "Learning the Grammars of Human Behavior". Carnegie Mellon University. May 2014.

Feng Zhou. “Spatial, Temporal and Spatio-Temporal Correspondence for Computer Vision”, Carnegie Mellon University. September 2014.

Ricardo Silva (co-advised with Joao Paulo Costeira and Alexandre Bernardino). “Unifying Low-rank Models for Computer Vision”. Carnegie Mellon University. February 2015.

Xuehan Xiong. “Supervised Newton Methods and its applications to computer vision”, Carnegie Mellon University. October 2015.

Vincent Chu (co-advised with Jeff Cohn). “Personalized SVM for AU-detection”, Carnegie Mellon University, May 2017.

Jayakorn Vongkulbhisal (co-advised with Joao Paulo Costeira). “Discriminative Optimization”. Carnegie Mellon University, January 2018.

Ada Zhang. “Segment SVMs for Parkinson’s monitoring”. Carnegie Mellon University, October 2019.

**Master’s
Advising**

Carnegie Mellon University

Rajesh Murthi (MSIT program). “Face Recognition across Pose”, Carnegie Mellon University, May 2005.

Mahaneeya Raman (MSIT program). “Omnidirectional Mosaic”, Carnegie Mellon University, May 2005.

Anandan Karunanithi (MSIT program). “Wearable Multimodal Platform”, Carnegie Mellon University, May 2005.

Tomas Simon. “AU detection with segment-based SVMs”, Carnegie Mellon University, April 2010.

Javier Hernandez. “Structured Instance Selection for Robust Classification”, Carnegie Mellon University, April 2010.

Feng Zhou. “Temporal Clustering and Alignment of Human Motion”, Carnegie Mellon University, May 2011.

Zengyin Zhang. “Human Pose Estimation from Images”, Carnegie Mellon University, May 2011.

Vincent Chu. “Personalized SVM for AU-detection”, Carnegie Mellon University, May 2013.

Yang Cai. “A Prototype System for Multimedia Event Detection (MED)”, Carnegie Mellon University, April 2013.

Francisco Vicente. “Eyes-off-the-road detection”, Carnegie Mellon University, May 2015.

Zehua Huang. “Bilinear Models for Facial Image Analysis”, May 2015.

Shitong Yao. “Sequential Max-Margin Classifiers”, May 2015.

Other Universities

Carlos Agell. "Multimodal Diaries", Polytechnic University, Barcelona, February 2007.

Oriol Vinyals. "Learning Kernel Expansions for Image Classification", Polytechnic University, Barcelona, April 2007.

Sara Trujillo. "Intelligent Surveillance from Ensembles of Cameras", University of Sevilla, Sevilla, May 2007.

Manuel Quero. "Patch-based Active Appearance Models ", University of Sevilla, Sevilla, June 2007.

Coro Albeiz. "Filtered Component Analysis for Active Appearance Models". San Sebastian School of Engineering University of Navarre, Spain, May 2007.

Javier Hernandez. "Support Vector Machines for Hot Flash Detection", La Salle School of Engineering, Barcelona, June 2007.

Esteban Curras. "Automatic Segmentation of Proteomic Images", Engineering school of Gijon, Gijon, Spain. September 2007.

Tomas Simon. "Action Unit Recognition from Video", Polytechnic University of Valencia, September 2007.

Javier Montano. "Depression assessment from Video", Polytechnic University of Cartagena, January 2008.

Junhe Gan. "Tracking and Recognizing Object across Poses in Multi-view Video", Lund University, Sweden, May 2008.

Hao Wang. "Feature Selection for 3D Human Motion Analysis", Lund University, Sweden, May 2008.

Pep Beltran. "A Multimodal Database for Human Activity Recognition", La Salle School of Engineering, Barcelona, June 2008.

Francisco Javier Perez Grau. "Learning Optimal representations for face fitting", University of Sevilla, Sevilla, June 2008.

Joan Perez. "Optimal Support Vector Feature Selection for Facial Feature Detection", La Salle School of Engineering, Barcelona, September 2008.

Alex Collado. "Real-time Facial feature tracking", La Salle School of Engineering, Barcelona, September 2008.

Xavier Boix. "Discriminative Approaches for Facial Fitting", La Salle School of Engineering, Barcelona, November 2008.

Jose Maria del Rio. "Learning Temporal Models for Hot Flash Detection", La Salle School of Engineering, Barcelona, November 2008.

Ruben Garcia. "Action Unit detection", La Salle School of Engineering, Barcelona, June 2009.

Margara Tejera. “Depression assessment from Video”, University of Sevilla, Sevilla, June 2009.

Daniel Casas. “Learning to track”, Polytechnic University, Barcelona, June 2009.

Mariate Ortiz. “Learning 3D face models”. Polytechnic University of Cartagena, September 2009.

Ricard Forcada. “Multimodal Data Collection”. La Salle School of Engineering, Barcelona, June 2010.

Jose Antonio Gil. “Grand Challenge Data Collection”. Technun, Navarra, Spain, June 2010.

Alberto Gil. “Quality of Life Technologies”. Technun, Navarra, Spain, June 2011.

Pablo Navarro. “Driver fatigue detection”. University of Valladolid, Spain, June 2013.

**Postdoctoral
Advising**

Stanislav Panev, 07/15-Present

Xavier Perez, 01/15-09/2016

Joan Navarro, 07/15-06/16

Ji Zhao, 08/12-08/13

Samarjit Das, 07/09-07/11 (co-advised with Jessica Hodgins)

Dong Huang, 07/09-present

Karim T. Abou-Moustafa, 09/11-05/12

Zad Harchaoui, 03/09-02/10 (co-advised with Jeff Cohn)

Minyoung Kim, 09/09-02/10

Laura Igual, 02/09-06/09

**Hosting
Visiting
Professors**

• Jinsong Han, 08/15-Present

• Deyu Meng, 08/12-08/13

• Petia Georgieva, 08/12-12/12

• Ying Chen, 03/09-02/10

• Xuelei Hu (co-advised with Jeff Schneider), Associate Professor, Nanjing University of Science and Technology. 04/09-02/10

• Tae-Kyun Kim. College fellow. Cambridge University. 06/09-09/09

• Maria Gloria Bueno (co-advised with Jeff Cohn), Assistant Professor, University of Castilla la Mancha, 01/09-09/09

• Oscar Deniz, Assistant Professor, University of Castilla la Mancha, 01/09-08/09

• Nicolas Guil, Professor in the CS department, University of Malaga, Spain, 06/07-08/07

**Hosting
Visiting
Scholars**

Xavi Martin, Carlos Vallespi, Jordi Casovila, Pep Beltran, Oriol Vinyals, Carlos Agell, Sara Trujillo, Coro Arbelaz, Guillermo Gonzalez, Manuel Quero, Esteban Curras, Nuria Brunet, Esteban Cuesta, Hao Wang, Junhe Gan, Jose Maria Cabero, Ricardo Cervera, Javier Montano, Maria Teresa Ortin, Jose Maria del Rio, Dan Casas, Margara Tejera, Moritz Tenorth, Ruben Garca, Jose Gonzalez, Joan Campoy, Gemma Roig, David Monzo, Xavier Boix, Ricardo Cervera, Ricard Forcada, Jose Antonio Gil, Ruben Nicolas, Yan

Tian, Yuan Shi, Jesus Mora, Yunfeng Zhu, Wei Liu, Karim T. Abou-Moustafa, Markus Storer, Sergio Valcarcel, Nayoung Lee, Lili Pan, Jesus Bonache, Yang Liu, Qiulei Han, Feng Xie, Fernando Batlle, Vincent Chu, Alberto Gil, Risheng Liu, Danny Lan, Xingguo Li, Hao Ji, Enrique Gonzalez, Pengtao Xie, Yixiong Liang, Aurelio Ponz, Ang Li, Zhiding Yu, Manuel Lopez Antequera, Breogan Amoedo, Francisco Vicente Carrasco, Shitong Yao, Pablo Navarro Sanz, Yingying Zhu, Liantao Wang, Yi Wang, Zehua Huang, Leon Ding, Santi Ortega Avila, Marc Estruch Tena, Julio Ortiz, Xavier Perez, Miguel Angel Bautista, Albert Pumarola, Longfei Han, Dingwen Zhang, Francisco Fernandez.

**Thesis
Committee
Member**

Carnegie Mellon University

Ralph Gross. “Face De-Identification using Multi-Factor Active Appearance Models”, Carnegie Mellon University, January 2008.

Alvaro Collet. “Object recognition and pose estimation in household environments”. Carnegie Mellon University, April 2009.

David Bradley. “Learning in Modular Systems”. Carnegie Mellon University, September 2009.

Marius Leordeanu. “Pairwise Constraints for Matching, Perceptual Grouping and Recognition”, Carnegie Mellon University, July 2009.

David Duke. “Intelligent Diabetes Assistant”, Carnegie Mellon University, January 2010.

Ahmed Bilal. “Feature-less Computer Vision for Classification and Alignment”, Carnegie Mellon University, June 2010.

Sarah Aboutalib. “Context-Dependent Multi-Cue Object Recognition”, Carnegie Mellon University, December 2010.

Tony Qi Wu. “Vision-based clear path detection through the use of in-vehicle camera”, Carnegie Mellon University, November 2012.

Seung-il Huh. “Cellular Event Detection in Time-lapse Live Cell Microscopy Images”, Carnegie Mellon University, December 2012.

Yuandong Tian. “Theory and Practice of Globally Optimal Deformation Estimation”, Carnegie Mellon University”, September 2013.

Susana Brandao. “Heat Based Descriptions for Multiple 3D view Object Recognition”, Carnegie Mellon University”, June 2015.

Tomas Simon. “Forecasting Human Motion in Social Situations”, Carnegie Mellon University”, June 2016.

John Lee. “Understand Visual Appearance of Road Scene using Monocular Camera”, Carnegie Mellon University”, June 2016.

Michael Taylor. “Joule Counting Correction for Electric Vehicles using Artificial Neural Networks”, Carnegie Mellon University”, December 2015.

Yanzhe Yang. “ Generation of gestures from audio ”, Carnegie Mellon University”, December 2021.

Other Universities

Jose Gonzalez. “Face Modeling Across Pose”, University of Malaga (Spain). December 2008.

Michael Van Den Bergh. “Visual Body Pose Analysis for Human-computer Interaction”, ETH Zurich, Dept. of Information Technology and Electrical Engineering, January 2010.

Mark Cox. “Unsupervised Alignment of Thousands of Images”, Queensland University of Technology, June 2010.

Markus Storer. “Shape and Appearance Based Analysis of Facial Images for Assessing ICAO Compliance”, Technical University of Graz, December 2010.

Jeff Girard. “Facial Expression Dynamics in Major Depressive Disorder: Duration and Velocity of Smiles and Brow-Raises in MDD and SAD”, University of Pittsburgh, May 2012 (M.S. program).

Ijaz Akhter, “Modeling Spatiotemporal Regularity in Deformable Structures”, LUMS School of Science and Engineering, Pakistan, October 2012.

Shahriar Shariat Talkhoonche. “Robust Time-Series Retrieval Using Adaptive Segmental Alignment”, Rutgers University, New Jersey, June 2013.

Richard Roberts, “Optical Flow Templates for Mobile Robot Environment Understanding and Navigation”, Georgia Tech University, May 2014.

Gayan Sadeep Jayasumana Hirimbura Matara Kankanamge, “Kernel Methods on Riemannian Manifolds”, Australian National University, October 2014.

Nicolaou, Michael, “Machine Learning for Automatic Analysis of Affective Behaviour”, Imperial College, November 2014.

Mayank Bansal, “Disparate view matching”, University of Pennsylvania, December 2014.

Ph. D. Qualifiers

Susana Brandao, April 15th 2012 (ECE).

Albal Priti, April 18th 2012 (ECE).

Stephen Siena, April 26th 2013 (ECE).

Zhiding Yu, April 16th 2013 (ECE).

Teaching

Courses Taught at Carnegie Mellon

- Guest lectures in Human Motion Modeling and Analysis, December 2012.
- Guest lectures in Machine Learning for Signal Processing, September (2009-2013).
- Guest lectures in Artificial Intelligence for Health and Sustainability, April 2012.
- Computer Vision seminars for summer interns, August 2010.
- Guest lecture in Data Visualization, October 2009.

Courses Taught at La Salle School of Engineering (Barcelona)

- Digital Image Processing (1997-1998, 1998-1999, 1999-2000)
- Computer Vision (2000-2001)
- Signal Processing (1998-1999)
- Calculus (1996-2000)
- Numerical Calculus (1995-1996, 1996-1997, 2000-2001)
- Algebra (2000-2001)

**Popular
Press
Coverage**

2000 Fast Forward, TV3, Barcelona, “PC’s que reconeixen l’expressio facial” (PC’s which recognize facial expressions), Program on TV, April 2001.

Patents

”Systems and methods for generating personalized emoticons and lip synching videos based on facial recognition”, US Patent App. 15/857,098.

”Systems and methods for swapping faces and face components based on facial recognition”, US Patent App. 15/857,200.

”Systems and methods for generating amplified facial expressions based on facial recognition”, US Patent App. 15/857,167

”System and method for processing video to provide facial de-identification”, US Patent App. 9,799,096

”System and Method for Detecting and Tracking Facial Features in Images”, US Patent App. 14596148

”Vehicle Operator Monitoring System and Method”, US Patent App. P029136-RD-SDJ

”Driver gaze detection system”,US Patent App. 61/754134

”Eyes-off-the-road classification with glasses classifier”, US Patent App. 61/754515

”Interactive Region-Based Linear 3D Face Models”, US Patent App. 13/089,675

**Software
Artifacts**

Robust Principal Component Analysis.

<http://www.salleurl.edu/ftorre/papers/rpca/rpca.zip>

Feature Selection for SVM.

<http://www.robots.ox.ac.uk/minhhoai/downloads.html>

Joint Localization and Classification.

<http://www.robots.ox.ac.uk/minhhoai/downloads.html>

Max-Margin Early Event Detectors.

<http://www.robots.ox.ac.uk/minhhoai/projects/mmed.html>

Temporal Commonality Discovery. 100 downloads since May 2013

http://humansensing.cs.cmu.edu/wschu/project_tcd.html

Aligned Cluster Analysis (ACA). 801 downloads since May 2011.

http://www.f-zhou.com/tc_code.html

Canonical Time Warping. 915 downloads since May 2011.

http://www.f-zhou.com/ta_code.html

Generalized Time Warping. 303 downloads since May 2012.

http://www.f-zhou.com/ta_code.html

Factorized Graph Matching. 1150 downloads since May 2012.

http://www.f-zhou.com/gm_code.html

IntraFace. 5000 downloads since June 2013.

<http://www.humansensing.cs.cmu.edu/intraface>

Show Case

Demonstrated IntraFace. *IEEE Automatic Face and Gesture Recognition 2015*.

Demonstrated IntraFace. *CVPR 2013*.

Demonstrated real-time face detection and tracking in omnidirectional video. *Neural Information Processing Systems, Vancouver 2004*.

Demonstrated real-time omnidirectional video. *International Conference on Multimodal Interfaces, State College, PA 2004*.

Permanent exhibition on facial expression analysis in the Carnegie Science Center (Pittsburgh). It is part of the roboworld exhibit.

Databases

I have co-lead the effort to collect detailed multimodal data of natural human activity. To record human behavior in settings that are as natural as possible, we have installed a fully operable kitchen and captured audio, video, accelerometer/gyroscopes, and motion capture data of 40 individuals cooking five different meals (brownies, salad, pizza, sandwich, and scrambled eggs) from start to finish. For more information see <http://kitchen.cs.cmu.edu/>.

Invited Colloquium, Workshop Presentations

“The past, the present and the future of facial expression analysis”,

Invited talk at workshop on Face and Gesture, May 2017.

“Vision-based systems for driver monitoring and de-identification”,

Workshop on Anonymization, Gothenburg, September 2015.

“Larry Davis”,

Larry Davis 60's birthday, Boston, June 2015.

“Human Sensing”,

Amazon, February 2015.

“Computational Face”,

Workshop on Spontaneous Facial Behavior Analysis, in conjunction with ECCV 2014, Zurich, September 2014.

“Human Sensing”,

Workshop on ChaLearn Looking at People: pose recovery, action/interaction, gesture recognition, in conjunction with ECCV 2014, Zurich, September 2014.

- “Spatio-Temporal Matching for Human Pose Detection”,
ECCV 2014 Area Chair Workshop, Zurich, June 2014.
- “Unsupervised and weakly supervised learning for human activity analysis”,
Workshop on Recent Advances in Computer Vision, Daejeon (Korea), September 2012.
- “Matrix Completion for Image Segmentation”,
ACCV 2012 Area Chair Workshop, Seoul, September 2012.
- “Facial Image Analysis”,
Samsung, Korea, September 2012.
- “Unsupervised and weakly supervised discovery of events for human sensing”,
Workshop on Gesture Recognition (CVPR), Providence, June 2012.
- “Metric Learning for Image Alignment”,
Workshop on Kernels and Distances for Computer Vision, Barcelona, November 2011.
- “Facial Expression Analysis”,
NASA/GSFC IS&T Colloquium, October 2010.
- “Unsupervised and Weakly-Supervised Event Discovery from Video (and Audio)”,
Workshop on Detection and Identification of Rare Audiovisual Cues, September 2010.
- “Local Minima Free Active Appearance Models”,
Workshop on Recent Trends in Computer Vision, University of Maryland, February 2010.
- “Computer vision for intelligent scene analysis and IED detection: A review to the past and a look to the future”,
NATO Defense Against Terrorism, November 2006.
- “Multi-Modal Biometrics at a Distance: A Review of the Past and a Look to the Future”,
MITRE, August 06.
- “The Application of Pattern Recognition Techniques and Inference to Threat Prediction”,
Great Lakes Photonics Symposium, June 2004.
- “Multilinear models for Computer Vision”,
Eastern North American Region of the International Biometric Society (ENAR),
March 2004.
- “Unifying bilinear and nuclear norm approaches for matrix factorization”,

Tech. Univ. of Graz, Institute for Computer Graphics and Vision, December 2013.

“Component Analysis”,

Georgia Tech., Computer Science, November 2013.

Idiap Research Institute, Martigny, August 2013.

Toyota Technology Institute, Chicago, July 2013.

University of Rutgers, Dept. of Computer Science, July 2013.

John Hopkins University, Dept. of Electrical Engineering, May 2013.

Tech. Univ. of Graz, Institute for Computer Graphics and Vision, May 2013.

ETH Zurich, Dept. of Information Technology and EE, May 2013.

University of Maryland, Dept. of Computer Science, May 2013.

University of Manchester, Dept. of Electrical Engineering, May 2013.

Pompeu University, Barcelona, April 2013.

Imperial College, Dept. of CS, April 2013.

Queen Mary and Westfield College. Uni. of London, Dept. of CS, April 2013.

Oxford University, Dept. of Electrical Engineering, April 2013.

Birmingham University, Dept. of Electrical Engineering, April 2013.

Ohio State University, Dept. of CS, April 2013.

West Virginia University, Dept. of CS and EE, April 2013.

“Human Sensing”,

Instituto Superior Tecnico, Dept. of EE and CS, Portugal, July 2009.

Ohio State University, Dept. of CS, November 2009.

University of Pittsburgh, Dept. of CS, November 2009.

Stony Brook, Dept. of CS, NY. December 2009.

General Electric, NY. December 2009.

Rensselaer Polytechnic Institute, Dept. of CS, NY, December 2009.

Tech. Univ. of Graz, Institute for Computer Graphics and Vision, January 2010.

University of Ljubljana, Computer and Information Science, January 2010.

Technical University of Munich, Dept. of CS, January 2010.

EPFL, School of Computer and Communication Science, January 2010.

ETH Zurich, Dept. of Information Technology and EE, January 2010.

Bonn University, Institut für Numerische Simulation, January 2010.

TU Darmstadt, Dept. of CS, January 2010.

University of Florida, Dept. of Computer and Information Science and Engineering, February 2010.

University of Central Florida, Dept. of CS, February 2010.

University of Maryland, Dept. of Computer Science, March 2010.

University of Pennsylvania, Dept. of Computer Science, March 2010.

West Virginia University, Dept. of CS and EE, March 2010.

University of Rutgers, Dept. of Computer Science, March 2010.

The Courant Institute of Mathematical Sciences, NYC, March 2010.

Harvard University, School of Engineering and Applied Science, April 2010.

Boston University, Dept. of Computer Science, April 2010.

MIT, Computer Science and Artificial Intelligence Laboratory, April 2010.

UoC-SD, Computer Science and Engineering, April 2010.

UCLA, Computer Science, April 2010.
USC, Institute for Robotics and Intelligence Systems, April 2010.
USC, Multimodal Communication and Computation Laboratory Institute for Creative Technologies, April 2010.
Stanford, Computer Science, April 2010.
University of Berkeley, Computer Science, April 2010.
University of Santa Barbara, Computer Science, April 2010.
Google, Mountain view, CA, April 2010.
Microsoft, Mountain view, CA, April 2010.
Georgia Tech., Computer Science, April 2010.
University of Toronto, Computer Science, May 2010.
Cornell University, Computer Science, May 2010.
Hebrew University, Computer Science, June 2010.
Columbia University, Statistics, September 2010.
Stevens Institute, Computer Science, October 2010.
Toyota Technology Institute, Chicago, October 2010.
CSIRO ICT Center, Brisbane, March 2011.
NICTA, Canberra, March 2011.
Max Planck Institute, Tubingen, June 2011.
Universidad de Barcelona, Barcelona, November 2011.
Computer Vision Center, Barcelona, November 2011.

“Learning representations for Human Sensing”,

Google, NYC, February 2008.
General Electric, NY, February 2008.
IBM, NYC, Feb. 2008.
ETH Zurich, Dept. of Information Technology and EE, September 2008.
Imperial College, Dept. of CS, September 2008.
Queen Mary and Westfield College. Uni. of London, Dept. of CS, September 2008.
Carnegie Mellon University, Dept. of Psychology, October 2008.
Telefonica, Spain, December 2008.

“Learning the representation for modeling, classification and clustering problems with energy-based component analysis methods”,

University of Pennsylvania, Dept. of Computer Science, April 2007.
University of Maryland, Dept. of Computer Science, April 2007.
Brown University, Dept. of Computer Science, April 2007.
Carnegie Mellon University, Dept. of Mathematical Sciences, April 2007.
Pompeu Fabra, Dept. of Electrical Engineering, January 2007.

“Subspace methods for classification, clustering and modeling high dimensional data”.

Carnegie Mellon University, Dept. of Biological Sciences, Feb. 2006.

“Component Analysis for Multimodal Diaries”,

University of Pennsylvania, Dept. of Computer Science, May 2005.
Siemens, New Jersey, May. 2005.

Columbia University, Dept. of Computer Science, May 2005.
University of Maryland, Dept. of Computer Science, May 2005.
Toyota Technology Institute, Chicago, May 2005.
Brown University, Dept. of Computer Science, May 2005.
Ohio State University, Dept. of Computer Science, May 2005.

“Extended Linear models for Computer Vision”,
FAMU-FSU, College of Engineering, January 2003.

“Robust parameterized subspace learning”,
Queen Mary and Westfield College. Uni. of London, Dept. of CS, Sept. 2001.
Oxford University, Dept. of Electrical engineering, September 2001.
University of Dundee, Dept. of Computer Science, December 2001.
University College London, Gatsby Computational Neuro. Unit, Dec. 2001.
Boston University, Dept. of Computer Science, April 2002.
Carnegie Mellon University, Robotics Institute, April 2002.