

Dr. Albert C. Cruz

Curriculum Vitae

Personal

Citizenship U.S. Citizen with no work restrictions
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Education

Dec. 2014 Ph.D. in Electrical Engineering University of California, Riverside
June 2008 B.S. in Electrical Engineering University of California, Riverside

Professional Appointments

2015 - Assistant Professor of Computer Science at California State University, Bakersfield,
Department of Computer & Electrical Engineering & Computer Science
2014 - 2015 Full-time Lecturer at California State University, Bakersfield, Department of Computer
& Electrical Engineering & Computer Science

Extramural Grants Accepted

**CFDA 2017 Specialty Crop Block Grant Program Title: Vision-Based Plant Disease Detection System
Using Deep Learning**
1 yr. funding of \$19,660 Co-PIs: Y. Ampatzidis, A. El-kereamy, **Albert Cruz** Nov. 2016
DoD Research and Education Program for HBCU/MI Equipment/Instrumentation FY 2016
**Title: Acquisition of a Micro-CT for Multi-Disciplinary Research, Teaching, and STEM Outreach at
California State University, Bakersfield**
PI: Brandon Pratt Key Personnel: **Alberto C. Cruz** December 2015

Intramural Grants Funded

Research Council of the University Faculty Mini-grant Program
Title: Automatic Gait Abnormality Detection from Video December 2016
6 mo. funding of \$4,989 PI: **Alberto C. Cruz** Co-PI: Brian Street
Research Council of the University Faculty Mini-grant Program
Title: Thermographic Analysis of Photovoltaics (TAP) June 2015
6 mo. funding of \$4,992 PI: **Alberto C. Cruz** Co-PI: Saeed Jafarzadeh

CSUB CERC Student Faculty Research Grant Program 2015 Round One

Title: Thermographic Real-time Preventative Measures in Power Systems

April 2015

3 mo. funding of \$3,500

PI: Alberto C. Cruz

Media Coverage

- 2016 **Motor Trend's Best Driver's Car**
- 2015 **Motor Trend's Best Driver's Car** (<http://goo.gl/hA35pL>)
- 2014 **Motor Trend's Best Driver's Car** (<http://goo.gl/Vc4Lm1>)
- 2013 **Science Magazine 343(6171)** (<http://goo.gl/zQR50Z>)

Patent Application

P. Talbot, S. Lin, A. Zahedi, D. Hill, V. On, **A. Cruz**, B. Bays and B. Bhanu, "Video analysis of cell health," U.C. Case No. 2013-731-1, May 1, 2013.

Publications

Refereed Journal Articles

- [J0] **A. Cruz**¹, B. Bhanu and N. S. Thakoor, "Background suppressing Gabor energy filtering," *Pattern Recognition Letters*, vol. 52, pp. 40-47, 2015. doi: 10.1016/j.patrec.2014.10.001.
- [J1] **A. Cruz**¹, B. Bhanu and N. S. Thakoor, "Vision and attention theory based sampling for continuous facial emotion recognition," *IEEE Trans. Affective Computing*, vol. 5, no. 4, pp. 418-431, 2014. doi: 10.1109/TAFFC.2014.2316151.

Book Chapters

- [B0] **A. Cruz**¹, B. Bhanu and B. Le, "Human Automotive Interaction: Affect Recognition for Motor Trend Magazine's Best Driver Car of the Year," in *Emotion and Attention Recognition Based on Biological Signals and Images*, S. A. Hosseini, Ed. InTech, 2016. doi: 10.5772/65684.
- [B1] **A. Cruz**¹, B. Bhanu and N. S. Thakoor, "Understanding of the biological process of non-verbal communication: facial emotion and expression recognition," in *Video Bioinformatics: From Live Imaging to Knowledge* (Springer Series on Computational Biology, vol. 22), B. Bhanu and P. Talbot, Eds. Springer, 2015. doi: 10.1007/978-3-319-23724-4.
- [B2] I. E. Cabrera¹, A. L. Tambo, **A. Cruz**, B. X. Guan, B. Bhanu and K. A. Borkovich, "Quantitative analyses during growth and development in the filamentous fungus *Neurospora Crassa*," in *Video Bioinformatics: From Live Imaging to Knowledge* (Springer Series on Computational Biology, vol. 22), B. Bhanu and P. Talbot, Eds. Springer, 2015. doi: 10.1007/978-3-319-23724-4.
- [B3] N. S. Thakoor, **A. Cruz**¹ and B. Bhanu, "Video bioinformatics databases and software," in *Video Bioinformatics: From Live Imaging to Knowledge* (Springer Series on Computational Biology, vol. 22), B. Bhanu and P. Talbot, Eds. Springer, 2015. doi: 10.1007/978-3-319-23724-4.

Conference Proceedings with Refereed Full Paper²

¹Corresponding author.

²Four pages or greater in length.

- [C0] Rajkumar Theagarajan¹, Bir Bhanu, **Albert Cruz**, Belinda Le, Asongu Tambo, “Novel Representation for Driver Emotion Recognition in Motor Vehicle Videos,” 2017 IEEE International Conference on Image Processing, 2017.
- [C1] **A. Cruz**¹ and A. Rinaldi, “Video Summarization for Expression Analysis of Motor Vehicle Operators,” 19th International Conference on Human-Computer Interaction, 2017.
- [C2] **A. Cruz**¹ and B. Street, “Frequency Divergence Image: A Novel Method for Action Recognition,” IEEE International Symposium on Biomedical Imaging (ISBI’17), 2017.
- [C3] **A. Cruz**¹, “Quantification of Cinematography Semiotics for Video-based Facial Emotion Recognition in the EmotiW 2015 Grand Challenge,” in Proceedings of the 2015 ACM on International Conference on Multimodal Interaction, 2015. doi: 10.1145/2818346.2830592.
- [C4] **A. Cruz**¹, B. Bhanu and N. S. Thakoor, “One shot emotion scores for facial emotion recognition,” in 2014 IEEE International Conference on Image Processing (ICIP), 2014. doi: 10.1109/ICIP.2014.7025275.
- [C5] G. Harlow, **A. Cruz**¹, L. Shuo, N. Thakoor, A. Bianchi, J. Chen, B. Bhanu and Z. Yang, “Automated spatial analysis of ARK2: A key microtubule and cell polarity link,” in 2013 IEEE 10th International Symposium on Biomedical Imaging (ISBI), 2013. doi: 10.1109/ISBI.2013.6556623.
- [C6] **A. Cruz**¹, B. Bhanu and N. Thakoor, “Facial emotion recognition with anisotropic inhibited Gabor energy histograms,” in 2013 20th IEEE International Conference on Image Processing (ICIP), 2013. doi: 10.1109/ICIP.2013.6738868.
- [C7] **A. Cruz**¹, B. Bhanu and N. Thakoor, “Facial emotion recognition in continuous video,” in 2012 21st International Conference on Pattern Recognition (ICPR), 2012.
- [C8] **A. Cruz**¹, B. Bhanu and N. Thakoor, “Facial emotion recognition with expression energy,” in Proceedings of the 14th ACM International Conference on Multimodal Interaction, 2012. doi: 10.1145/2388676.2388777.
- [C9] **A. Cruz**¹ and B. Bhanu, “A biologically inspired approach for fusing facial expression and appearance for emotion recognition,” in 2012 19th IEEE International Conference on Image Processing (ICIP), 2012. doi: 10.1109/ICIP.2012.6467437.
- [C10] **A. Cruz**¹, B. Bhanu and S. Yang, “A psychologically inspired match-score fusion model for video-based facial expression recognition,” in Affective Computing and Intelligent Interaction, 2011.

Conference Proceedings with Refereed Poster/Extended Abstract

- [C11] **A. Cruz**, Y. Ampatzidis¹, L. De Bellis, and A. Luvisi, “Vision-Based Plant Disease Detection System Using Transfer and Deep Learning,” 2017 ASABE Annual International Meeting, 2017. *Accepted.*
- [C12] A. Rinaldi¹, O. Oseguera, J. A. Tuazon, **A. C. Cruz**, “Sequence to Sequence Dialogue with Sentiment Analysis Features,” 19th International Conference on Human-Computer Interaction, 2017.
- [C13] O. Oseguera¹, A. Rinaldi, J. A. Tuazon, **A. C. Cruz**, “Automatic Quantification of the Veracity of Suicidal Ideation in Counseling Transcripts,” 19th International Conference on Human-Computer Interaction, 2017.
- [C14] A. Rinaldi¹ and **A. Cruz**, “Deep Context Injection for Super-resolution,” The 20th International Conference on Image Processing, Computer Vision, and Pattern Recognition, 2016. *24-27% acceptance rate.*
- [C15] G. Hasta and **A. Cruz**¹, “Facial Emotion Recognition for Motor Vehicle Operators,” The 20th International Conference on Image Processing, Computer Vision, and Pattern Recognition, 2016. *24-27% acceptance rate.*

- [C16] Christian T. Michael and A. Cruz¹, “Approximating Neuron Activity via Lifetime Charge in Artificial Neural Networks,” 28th Annual CSU Biotechnology Symposium, 2016.

Conference Proceedings with Abstract/Poster

- [C17] G. Harlow¹, A. Cruz, B. Bhanu, Z. Yang, S. Li, N. Thakoor, A. C. Bianchi, and J. Chen, “Videobioinformatics: Automatic 3D pavement cell analysis,” in NSF IGERT Poster and Video Competition, 2013.
- [C18] G. Harlow¹, S. Li, A. Cruz, J. Chen and Z. Yang, “Visualizing leaf cells from within,” in NSF 2013 International Science & Engineering Visualization Challenge, 2013.
- [C19] A. Cruz¹ and B. Bhanu, “Recognizing human facial emotions in video: A psychologically-inspired fusion model,” in NSF IGERT Poster and Video Competition, 2012.
- [C20] A. Cruz¹, B. Bhanu and Z. Yang, “Spatiotemporal dynamics of the growth of pollen tubes using GFP-tagged RIC4 videos,” in Workshop on Bio-image Informatics: Biological Imaging, Computer Vision and Data Mining, 2008.
- [C21] A. Cruz¹, B. Bhanu and Z. Yang, “Automatic tracking of RIC4 localization in pollen tubes,” in University of California, Riverside Symposium for Undergraduate Research, 2008.

Regional/National Special Student Sessions

- [S0] A. Rinaldi¹ and A. Cruz³, “Image Super-resolution for Infrared Thermography,” 31st Annual CSU Student Research Competition, 2017.
- [S1] J. Ramirez¹ and A. Cruz³, “Sentiment Detection In Video,” 31st Annual National Conference on Undergraduate Research, 2017.
- [S2] K. Bryan, S. Jafarzadeh³, A. Cruz³, “Infrared Thermography for Automatic Hot Spot Detection of Photovoltaic Panels,” IEEE Conference on Technologies for Sustainability Student Poster Contest, 2016.
- [S3] A. Singh¹ and A. Cruz³, “Detection of Motor Vehicle Operator Attention from a Single Camera,” Southern California Conference on Undergraduate Research, 2016.
- [S4] Kody Bryan and A. Cruz^{1,3}, “Cost Efficient Long-wave Infrared Thermography to Detect Faults in Photovoltaics,” Southern California Conference on Undergraduate Research, 2015.
- [S5] Geromar Hasta and A. Cruz^{1,3}, “Automatic Detection of Psychophysiological State of Vehicle Operators through Video,” Southern California Conference on Undergraduate Research, 2015.

Awards

- 2015** **Outstanding Reviewer** from Elsevier Pattern Recognition.
- 2013** **Honorable Mention** from the 2013 NSF International Science and Engineering Visualization Challenge. 3 minute science video documentary.
- 2013** **Community Choice Award** from the NSF Integrative Graduate Education Research Traineeship (IGERT) Video and Poster Competition 2013. National competition to create best 3-minute science video documentary (\$2000 award).
- 2013** **4th Place** Audio/Visual Emotion Challenge 2013, Word-Level Sub-Challenge. International grand-challenge to create best algorithm for detection of facial emotions using video of the face.
- 2012** **Judge’s Choice Award** at NSF IGERT Video and Poster Competition 2012. (\$2000 award).

³Faculty mentor.

- 2011** **2nd Place Award** Audio/Visual Emotion Challenge 2011, Video Sub-Challenge
- 2010** **Fellowship** with NSF Integrative Graduate Education Research and Traineeship (IGERT) in Videobioinformatics. Prestigious research fellowship program awarded to only top universities (\$30000/yr).
- 2007** **Undergraduate Research Fellowship** with NSF Research Experiences for Undergraduates (REU) for Bioengineering Research Institute for Technical Excellence. (\$5000 stipend).

Invited Talks and Panels

- 2017** **MESA Bakersfield College STEM and Pre-Health Conference Workshop.** STEM Panelist.
- 2014** **University of California, Riverside.** Biologically Inspired Facial Emotion Recognition.

Professional Service and Affiliations

- 2018** **Finance Co-Chair.** 2018 IEEE International Conference on Automatic Face and Gesture Recognition.
- 2017** **Program Committee.** 2017 IEEE International Conference on Tools with Artificial Intelligence.
- 2016** **Program Committee.** 2016 IEEE International Conference on Tools with Artificial Intelligence.
- 2016** **Committee Member.** 2016 IEEE RAS & EMBS International Conference on Biomedical Robotics and Biomechatronics.

Referee for Applied Computing Informatics, Bantham Science Publishers, Cambridge University Press, Elsevier Pattern Recognition Letters, Elsevier Pattern Recognition, IEEE Sensors Journal, IEEE Transactions on Affective Computing, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Human Machine Systems, IEEE Transactions on Multimedia, IET Computer Vision, and Journal of Zhejiang University Science C (Computers & Electronics).

Member of American Society of Agricultural and Biological Engineers (ASABE), Institute of Electrical and Electronics Engineers (IEEE) Signal Processing (SP) and Computer Societies, Association for Computing Machinery (ACM)

Departmental and University Service

- 2016 - Cur.** Faculty Mentor for CSUB's ACM Club
- 2016** Faculty Search Committee for Lecturer in Computer Science
- 2016** Faculty Mentor for Chevron REVS-UP
- 2015** Faculty Mentor for ED MSEIP
- 2015** Program Review Committee for the Computer Engineering Program
- 2015** ABET Preparation Committee for the Electrical Engineering Program
- 2015** Faculty Search Committee for Computer Science

Teaching Experience

C.S.U. Bakersfield

Advanced Artificial Intelligence	S '15, F '16
Artificial Intelligence	W '15, S '16, S '17, S '18
Assembly Language	F '14, F '15
Computer Architecture	F '17
Computer Networks	S '15, W '16, S '18
Computer Vision	W '15, F '16
Image Processing	W '16
Programming Fundamentals	F '14
Senior Seminar	F '16, S '17

U.C. Riverside

Engineering Circuit Analysis	F '13, S '13, Su '13
Logic Design	W '14
MATLAB and Computer Vision	S '12, S '13

References

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