

Sergio D. Cabrera, Ph. D.

February 25, 2014

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Professional Preparation

Rice University, Houston, TX	Electrical Eng: Ph. D. 1985.
University of Arizona, Tucson, Arizona	Electrical Eng: M. S. 1979.
Massachusetts Institute of Technology, Cambridge, MA.	Electrical Eng: S. B. 1977.

Full-Time Appointments and Honors

1/2002 to 8/2011	Texas Instruments Foundation Professorship in Digital Signal Processing, UTEP
9/1994 to present	Associate Professor, Dept. Electrical & Comp. Eng., UTEP
1/1992 to 8/1994	Assistant Professor, Dept. Electrical & Comp. Eng., UTEP
8/1987 to 12/1991	Assistant Professor, Dept. Electrical & Comp. Eng., Penn. State Univ.
6/1985 to 8/1987	Senior Engineer, Anadrill/Schlumberger, Sugar Land, Texas

Recent Summer Appointments

Summer 2004:	NASA Goddard Space Flight Center, Greenbelt, MD
Summer 2001:	U. S. Army Research Laboratory, White Sands NM.

Recent, Representative Publications

- Ajay Verma, Sergio Cabrera, Homer Nazeran, "Spectral- and Time-Domain Analysis of Heart Rate Variability Signals from Multiple Photoplethysmographic (PPG) Sensors" *to appear in Proc. Of 30th Southern Biomedical Engineering Conference (SBEC), Gulfport, MS, April 2014*
- Kosheleva, Olga, Karen Villaverde, and Sergio D. Cabrera. "Back to the future: Advanced control techniques justify-on a new level-traditional education practices." In *IFSA World Congress and NAFIPS Annual Meeting (IFSA/NAFIPS), 2013 Joint*, pp. 466-470. June 2013.
- Ajay Verma, Sergio Cabrera, Allan Mayorga, Homer Nazeran, "A Robust Algorithm For Derivation of Heart Rate Variability Spectra From ECG And PPG Signals" in *Proc. Of 29th Southern Biomedical Engineering Conference (SBEC), Miami, FL, pp 35-36, April 2013*
- Carreon, Jerry A., and Sergio D. Cabrera. "Towards the use of learned dictionaries and compressive sensing in wideband signal detection," in *Proc. Of Compressive Sensing II, Vol. 8717, SPIE Defense, Security, and Sensing*. Baltimore MD, May 2013.
- Mohammed Q. Alkhatib, Sergio D. Cabrera, and Thomas E. Gill "Automated Detection of Dust Clouds and Sources in NOAA-AVHRR Satellite Imagery," in *Proc. of 2012 IEEE Southwest Symposium on Image Analysis and Interpretation, Santa Fe, NM, April 2012.*
- Abdul Jabeer Shaik and Sergio D. Cabrera, "Spatially Adaptive Superresolution Using the Optimal Recovery Framework, in *Proc. of 2012 IEEE Southwest Symposium on Image Analysis and Interpretation, Santa Fe, NM, April 2012.*
- Mario I. Chacon-Murguía, Yearim Quezada-Holguín, Pablo Rivas-Perea, and Sergio Cabrera. 2011. Dust storm detection using a neural network with uncertainty and ambiguity output analysis. In *Proceedings of the Third Mexican conference on Pattern recognition (MCP'R'11)*, José Francisco Martínez-Trinidad, Jesús Ariel Carrasco-Ochoa, Cherif Ben-Youssef Brants, and Edwin Robert Hancock (Eds.). Springer-Verlag, Berlin, Heidelberg, 305-313.
- Mohammed Q. Alkhatib and Sergio D. Cabrera, "Multiresolution and Directional Filtering Techniques for Detecting Dust Storm Direction in Satellite Imagery," in *Proc. Of Algorithms and*

Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVII, SPIE Vol. 8048, pp. 80480V-1 to 11, Orlando FL, April 2011.

- **Sergio D. Cabrera**, Veenarai Moram and Jose G. Rosiles, “Sensor deployment optimization based on optimal recovery interpolation,” in Proc. Of Wireless Sensing, Localization, and Processing VI, SPIE Vol. 8061, pp 806107-1 to 12, Orlando FL, April 2011.
- Veenarai Moram and **Sergio D. Cabrera**, “Superresolution Using the Optimal Recovery Framework with Automatic Generalized Cross-Validation,” in Proc. Of IEEE Digital Signal Processing Workshop and IEEE Workshop on Signal Processing Education (DSP/SPE) 2011, pp. 344 – 349, Sedona, AZ, Jan. 4-7, 2011.
- Ravi K. Samala, Venkata S. Potunuru, Jianying Zhang, **Sergio D. Cabrera**, Wei Qian, “Comparative Study of Feature Measures for Histopathological Images of the Lung,” in Proc. of Digital Image Processing and Analysis (DIPA), Optical Society of America Optics and Photonics Congress, paper No. DTuB2, Tucson, AZ, June 7-9 2010.
- James R. Roeder, and **Sergio D. Cabrera**, “Assessment of super-resolution for face recognition from very-low resolution images in sensor networks,” in Proc. Of Visual Information Processing XVIII, SPIE Vol. 7341, Orlando FL, April 2009.
- S. Janugani, V. Jayaram, **S. D. Cabrera**, J. G. Rosiles, T. E. Gill, and N. Rivera Rivera, “Directional Analysis and Filtering for Dust Storm Detection in NOAA-AVHRR Imagery,” in Proc. Of Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XV, SPIE Vol. 7334, Orlando FL, April 2009
- Rufino J. Dominguez, **Sergio D. Cabrera**, J. Gerardo Rosiles, and Javier Vega-Pineda, “Reconstruction in Compressive Sensing Using Affine Scaling Transformations with Variable-p Diversity Measure,” in Proc. Of IEEE Digital Signal Processing Workshop and IEEE Workshop on Signal Processing Education (DSP/SPE) 2009, pp. 708–713, Marco Island, FL, Jan. 4-7, 2009.
- **S. D. Cabrera**, L. Upadhyayula, and J. G. Rosiles, “Optimal Recovery for Non-Uniform Signal Interpolation: a Re-Visit for Applications to Wireless Sensor Networks,” in Proc. Of Sensor, Signal and Information Processing (SenSIP) Workshop, CD-ROM, Sedona, AZ, May 11-14, 2008.
- **S. D. Cabrera**, Rufino Dominguez, J. Gerardo Rosiles, and Javier Vega-Pineda “Variable-p Affine Scaling Transformation Algorithms for Improved Compressive Sensing,” in Proc. Of Sensor, Signal and Information Processing (SenSIP) Workshop, CD-ROM, Sedona, AZ, May 11-14, 2008.
- Aldo Lucero, **Sergio Cabrera**, Edward Vidal Jr., “On the use of JPEG2000 to Achieve Minimum L-Infinity Error when Specifying a Compression Ratio,” in Proc. of 14th IEEE International Conference on Image Processing, Volume 2, pp. 361–364, San Antonio, TX, September 2007.
- **Sergio D. Cabrera**, Jose Gerardo Rosiles, and Alejandro E. Brito, “Affine Scaling Transformation Algorithms for Harmonic Retrieval in a Compressive Sampling Framework, in Proc. of Wavelets XII, SPIE Vol. 6701, paper 87, San Diego, CA, August 2007.
- O. Kosheleva, B. E. Usevitch, **S. D. Cabrera**, and E. Vidal, Jr, “Rate Distortion Optimal Bit Allocation Methods for Volumetric Data Using JPEG2000,” IEEE Trans. on Image Processing, Vol. 15, No. 8, pp. 2106-2112, Aug. 2006.
- A. E. Brito, Cristina Villalobos, and **S. D. Cabrera**, “Interior-Point Methods in l_1 Optimal Sparse Representation Algorithms for Harmonic Retrieval,” Journal of Optimization and Engineering, Vol. 5, pp. 503-531, Dec. 2004.
- A. E. Brito, S. H. Chan, and **S. D. Cabrera**, “SAR Image Superresolution via 2-D Adaptive Extrapolation,” Journal of Multidimensional Systems and Signal Processing, 4(1): 83-104; Jan. 2003.
- E. Whittenberger, A. E. Brito, and **S. D. Cabrera**, “Applying the Eigenfaces and Fisherfaces Methods to Circuit-Board Inspection,” Optical Engineering, Vol. 39, No. 12, pp. 3154-3164, December 2000.

Recent Grants and Contracts

1- H. Nazeran (PI,PD), **S. D. Cabrera (co-PI)**, “Smart-phone evidence-based stress level monitor and mental fatigue detector,”

Source: **UT Transform Program** Amount Awarded: **\$10,000**

Duration: May 6, 2013 – August 31, 2014 (14 months)

2- H. Nazeran (PI,PD), **S. D. Cabrera (co-PI)**, “Explorations into Smartphone-based Implementation of a Photoplethysmographic (PPG) Device for Detection and Monitoring of Mental Fatigue,”

Source: **UTEP Office of the Provost** Amount Awarded: **\$11,000**

Duration: June 1, 2012 – August 31, 2012 (Summer 2012)

3- G. Rosiles (PI, PD), V. Gonzalez (co-PI), and **S. D. Cabrera (co-PI)**, “Launching a Sensor Networks Research and Student Development Program for Electrical and Computer Engineering Students,”

Source: **DOD** Amount Awarded: **\$800,000 approx.**

Duration: Oct. 1, 2006 – Sept. 30, 2010 (4 year but funds were lost due to legal challenges)

4- **S. D. Cabrera (PI, PD)**, “Data Compression in Support of IMETS,”

Source: **U. S. Army Research Laboratory**

Amount Awarded **\$103,000** (after 2 modifications)

Duration: June 1, 2003 – March 30, 2006 (3+ years with modifications)

5- **S. Cabrera (PI, PD)**, John Moya, and Elsa Villa, “Launching the Infinity Project Statewide,”

Source: **Texas Technology Workforce Development Grant Program - 2002**

Amount Awarded: **\$90,000**

Duration: January 2002 – August 2007 (5 years with no-cost extensions)

6- **S. Cabrera** (Project Director), M. Shadaram, B. Usevitch, G. Lush, “Developments and Enhancements in Communications and Digital Signal Processing,”

Source: Texas Instruments Foundation (TIF)

Funds: **\$740,000** + Endowment

Duration: June 2000 – May 2003 (3 years)

Representative, Recent Professional Activities

- UTEP Faculty Senate: Chair of Committee on Committees (Sept. 2012 – present)

- UTEP Faculty Senate Executive Council (Sept. 2008 – Aug. 2010)

- UTEP Provost Search Committee (April 2010 – Nov. 2010)

-Technical Program Committee member: 2010, 2012, 2014 IEEE Southwest Symposium on Image Analysis and Interpretation.

-Technical Program Committee member: 2010 Digital Image Processing and Analysis (DIPA) Conference, Optical Society of America Optics and Photonics Congress, Tucson, AZ, June 2010

-Member of the National Committee for Information Technology Standards, L3 group: US delegation to the JPEG2000 image and data compression standardization committee. (January 2002 – Sept. 2005)

-Registration Chairman: IEEE Digital Signal Processing Workshop and Signal Processing Education Workshop: 2000 and 2004.