
Curriculum Vitae of
SEBASTIÁN E. GODOY

Assistant Professor
Department of Electrical Engineering
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EDUCATION

Ph.D. in Engineering, University of New Mexico, NM, USA (2015)
M.Sc. in Electrical Engineering, University of Concepción, Concepción Chile (2009)
B.Sc. in Electrical Engineering, University of Concepción, Concepción, Chile (2006)

EMPLOYMENT

University of Concepción, Concepción, Chile
Assistant Professor (2015 – Present)
Academic Collaborator (2007 – 2015)

Center for High Technology Materials, University of New Mexico, NM, USA
Research Assistant (2010 – 2015)

The New Mexico Cancer Nanoscience and Microsystems Training Center, NM, USA
Research Assistant (2012 – 2014)

Skinfrared, LLC, Albuquerque, NM, USA
Research Intern (2011 – 2014)

RESEARCH

Areas of interest

- **Signal and image processing:** Algorithms for compressive spectral imaging; shutterless non-uniformity correction algorithms for thermal and spectral imagers; statistical modeling and compensation of noise; medical image analysis.
- **Communication theory and optical communication:** Probabilistic analysis of channels and receivers; detection theory; estimation theory.
- **Biomedical engineering:** medical image analysis; text identification; detection of anomalies in medical imaging; detection theory applied to medical diagnosis

Research Funds

Summary of received research funds (since 2015)

PI or Co-PI: Over \$160M CLP (about US\$ 300K)
PI: Over \$90M CLP (about US\$ 150K)

Active grants

1. Fondo Nacional de Desarrollo Científico y Tecnológico (FONDECYT) Chile, FONDECYT Iniciación 11150702, "Thermal characterization of the human skin with low-cost infrared imagers for medical applications," PI: Sebastián Godoy, \$94,000,000 CLP (about US\$150,000)

2. Fondo Nacional de Desarrollo Científico y Tecnológico (FONDECYT) Chile, FONDECYT Regular 1160613, "Digital Super-resolution and Nonuniformity Correction based in Infrared Natural Scene Statistics for Infrared Microscopic Imaging," PI: Sergio Torres, Co-PI: Sebastián Godoy, over \$92,000,000 CLP (about US\$150,000)
3. Fondo Nacional de Fomento al Desarrollo Científico y Tecnológico (FONDEF) IDeA versión III en dos etapas, "Desarrollo de Biosensores Optoelectrónicos y Algoritmos de correlación para cuantificar el espectro emitido por nanopartículas de oro que detectan la presencia de residuos de antibióticos en leche cruda", FONDEF ID16I10221. PI: Sergio Torres, Main Researcher: Sebastián Godoy; over \$200,000,000 CLP (about US\$310,000)
4. Fondo Nacional de Fomento al Desarrollo Científico y Tecnológico (FONDEF) Primer Concurso de Investigación Tecnológica en Minería, "Barra Intercelda Segmentada-Triple (BST) para Electro-refinación de Cobre", FONDEF IT16M10014. PI: Eduardo Weichman, Researcher: Sebastián Godoy; over \$200,000,000 CLP (about US\$310,000)

Past grants

1. Fondo Nacional de Fomento al Desarrollo Científico y Tecnológico (FONDEF) VIU, "Dispositivo no invasivo, rápido, portátil y de bajo costo para la detección de pie diabético," code VIU16P0093, Director General, 2016-2017.

Publications & Patents

Summary

Total Patents: 3 (3 in the US)
 Total publications: 30
 Journals: 11
 Peer-reviewed conferences: 19
 Total citations: 123
 h-index: 6
 i10-index: 5
 (REF: Google Scholar, November 2017)

Issued Patents

1. US Patent 9,430,842, "Method to Fuse Material Classification with Spatio-Spectral Edge Detection in Spectral Imagery," Majeed M. Hayat, Sanjay Krishna and **Sebastián E. Godoy**, issued August 30, 2016.
<https://stcunm.flintbox.com/public/project/24073/>
2. US Patent 9,471,974, "A Method and System for Feature Extraction and Decision Making from Series of Images," Sanjay Krishna, Sanchita Krishna, Majeed M. Hayat, Pradeep Sen, Maziar Yaesoubi, **Sebastián E. Godoy** and Ajit V. Barve, Utility Patent issued Oct 18, 2016.
3. US Patent 9,691,147, "A Method and System for Feature Extraction and Decision Making from Series of Images," Sanjay Krishna, Sanchita Krishna, Majeed M. Hayat, Pradeep Sen, Maziar Yaesoubi, **Sebastián E. Godoy** and Ajit V. Barve, Continuation Patent issued Jun 27, 2017.

Patents' Applications

1. Majeed M. Hayat, Sanjay Krishna, Sebastian E. Godoy and David Ramirez, "Methods and Systems for Detecting Cancer," U.S. Patent Application PCT US2015/062500. International Publication Date: 2 June 2016.

Journal manuscripts

1. Fabian Inostroza, Silvana Diaz, Javier Cárdenas, Sebastian Godoy and Miguel Figueroa, "Embedded registration of visible and infrared images in real time for noninvasive skin cancer screening," *Microprocessors and Microsystems*, In press, September 2017 [Available online at <https://doi.org/10.1016/j.micpro.2017.09.006> since 28/September/2017].
2. Nitesh K Kundaa, Julia Hautmann, Sebastián E Godoy, Patricia Marshik, Ramesh Chand, Sanjay Krishna and Pavan Muttill, "A novel approach to study the pMDI plume using an infrared camera and to evaluate the aerodynamic properties after varying the time between actuations," *International Journal of Pharmaceutics*, Vol. 526, Issues 1–2, pp. 41–49, 30 June 2017, DOI: 10.1016/j.ijpharm.2017.04.051
3. Sebastián E. Godoy, Majeed M. Hayat, David A. Ramirez, Stephen A. Myers, R. Steven Padilla, and Sanjay Krishna, "Detection theory for accurate and non-invasive skin cancer diagnosis using dynamic thermal imaging," Vol. 8, Issue 4, pp. 2301-2323 (2017), DOI: 10.1364/BOE.8.002301
4. Sebastián E. Godoy, David A. Ramirez, Sanchita Krishna, Stephen A. Myers, Greg von Winckel, Sanchita Krishna, Marianne Berwick, R. Steven Padilla, Pradeep Sen and Sanjay Krishna, "Dynamic Infrared Imaging for Skin Cancer Screening," *Infrared Physics & Technology*, Volume 70, May 2015, Pages 147–152 DOI: 10.1016/j.infrared.2014.09.017
5. Zhabing Tian, Sebastián E. Godoy, H. S. Kim, Ted Schuler-Sandy, John A. Montoya and Sanjay Krishna, "High operating temperature interband cascade focal plane arrays," *Appl. Phys. Lett.* vol. 105, no. 5, pp. 051109-051109-5, Aug 2014
6. Biliانا Paskaleva, Sebastián E. Godoy, Woo-Yong Jang, Steven C. Bender, Sanjay Krishna and Majeed M. Hayat, "Model-based Edge Detector for Spectral Imagery using Sparse Spatio-spectral Masks," *IEEE Transactions on Image Processing*, vol. 23, no. 5, pp. 2315,2327, May 2014, DOI: 10.1109/TIP.2014.2315154, ISSN: 1941-0042
7. Stephen Myers, Sebastián E. Godoy, David Ramirez, Greg Von Winckel, Sanchita Krishna, Marianne Berwick, R. Steven Padilla and Sanjay Krishna, "Dynamic thermal infrared imaging non-invasively detects skin cancer with high sensitivity and specificity," *Journal of Investigative Dermatology*, vol. 134, Supplement 1, p. S102, 2014, DOI: 10.1038/jid.2014.109.
8. Cesar San Martin, Carlos Deocares, Sebastián E. Godoy, Pablo Meza and Daniella Bonilla, "Wavelet-FFT Filter Applied to Nonuniformity Correction in Infrared Imaging System," *Lecture Notes in Computer Science* (2012), Volume 7441/2012, pp. 355-363. DOI: 10.1007/978-3-642-33275-3_44, ISBN: 978-3-642-33275-3.
9. Ajit V. Barve, Saumya Sengupta, Jun Oh Kim, John Montoya, Brianna Klein, Mohammed A. Shirazi, Marziyeh Zamiri, Yagya D. Sharma, Sourav Adhikary, Sebastián E. Godoy, Woo-Yong Jang, Glaucio R. C. Fiorante and Sanjay Krishna,

- "Barrier Selection Rules for Quantum Dots-in-a-Well Infrared Photodetector," IEEE Journal of Quantum Electronics, Vol. 48, No. 10, October 2012.
10. Woo-Yong Jang, Majeed M. Hayat, Sebastián E. Godoy, Payman Zarkesh-Ha, Steven C. Bender and Sanjay Krishna, "Data-compressive paradigm for multispectral sensing using tunable DWELL mid-infrared detectors," Optics Express, Vol. 19, Issue 20, pp. 19454-19472 (2011).
 11. Sebastián E. Godoy, Jorge E. Pezoa and Sergio N. Torres, "Noise-cancellation-based nonuniformity correction algorithm for infrared focal-plane arrays," Applied Optics, Vol. 47, Issue 29, pp. 5394-5399 (2008)

Conference manuscripts

1. Silvana Diaz, Javier E. Soto, Fabián Inostroza, Sebastián E. Godoy and Miguel Figueroa, "An embedded system for image segmentation and multimodal registration in noninvasive skin cancer screening," Engineering in Medicine and Biology Society (EMBC), 2017 39th Annual International Conference of the IEEE, 11-15 Julio 2017, Seogwipo, South Korea.
2. Laura A. Viafora, Sergio N. Torres, Sebastián E. Godoy, Wagner E. Ramírez, Pablo A. Gutierrez, Guillermo E. Machuca and Anselmo Jara, "Infrared microscopy for recognizing anatomical structures in thermal maps of index finger pads," IEEE Photonics Conference (IPC), 2-6 October 2016 at the Hilton Waikoloa Village, Waikoloa, Hawaii, USA.
3. Fabian Inostroza, Javier Cardenas, Sebastian Godoy and Miguel Figueroa, "Embedded multimodal registration of visible images on long-wave infrared video in real time," 2016 Euromicro Conference on Digital System Design (DSD), Limassol, Cyprus August 31 - September 2, 2016, pp. 176-183. doi: 10.1109/DSD.2016.99.
4. R. M. Clark, B. Coffman, D. A. Ramirez, Sebastián E. Godoy, S. A. Myers, T. McGregor, S. Krishna, P. G. McGuire and T. R. Howdieshell, "Accelerated Myocutaneous Revascularization Following Graded-Ischemia in db/db Mice," The 10th Annual Academic Surgical Congress, February 3-5, 2015, Encore, Las Vegas, NV.
5. Zhaobing Tiang, Ted Schuler-Sandy, Sebastián E. Godoy, H. S. Kim and Sanjay Krishna, "High Operating Temperature InAs/GaSb Type-II Superlattices," 18th International Conference on Molecular Beam Epitaxy (MBE), September 7-12, 2014, Flagstaff, AZ.
6. Javad Ghasemi, Payman Zarkesh-Ha, Sanjay Krishna, Sebastián E. Godoy, and Majeed M. Hayat, "A Novel Readout Circuit for On-sensor Multispectral Classification," 2014 IEEE 57th International Midwest Symposium on Circuits and Systems (MWSCAS 2014), August 3-6, 2014, College Station, TX
7. Sebastián E. Godoy, David Ramirez, Stephen Myers, Greg von Winckle, Sanchita Krishna and Sanjay Krishna, "Dynamic Infrared Imaging for Skin Cancer," Quantum Structured Infrared Photodetectors International Conference, QSIP 2014 (June 29 - July 3, 2014), Santa Fe, NM, USA.
8. Zhaobing Tiang, Ted Schuler-Sandy, Sebastián E. Godoy, C. Kadlec, H. S. Kim and Sanjay Krishna, "Interband Cascade Infrared Photodetectors and their Focal Plane Arrays," Quantum Structured Infrared Photodetector International Conference, QSIP 2014 (June 29 - July 3, 2014), Santa Fe, NM, USA.
9. Zhaobing Tiang, Sebastián E. Godoy, H. S. Kim, Ted Schuler-Sandy, J. Montoya and Sanjay Krishna, "Mid-wave infrared interband cascade photodetector and

- focal plane arrays," Proc. SPIE 9070, Infrared Technology and Applications XL, 90701K (June 26, 2014). SPIE Defense + Security, 2014, Baltimore, Maryland, United States. doi: 10.1117/12.2049988
10. Stephen Myers, Sebastián E. Godoy, David Ramirez, Greg Von Winckel, Sanchita Krishna, Marianne Berwick, R. Steven Padilla and Sanjay Krishna, "Dynamic thermal infrared imaging non-invasively detects skin cancer with high sensitivity and specificity," SID 2014 – Society for Investigative Dermatology Annual Meeting, May 7, 2014 - May 10, 2014, Albuquerque Convention Center, Albuquerque, NM, USA.
 11. Zhaobing Tiang, Ted Schuler-Sandy, Sebastián E. Godoy, H. S. Kim, J. Montoya and Sanjay Krishna, "Mid-wave infrared interband cascade photodetector and focal plane arrays," 2013 IEEE Photonics Conference (IPC), pp. 598-599, 8-12 September 2013, Hyatt Regency Bellevue, Bellevue, WA, USA.
 12. Julia Hautmann, Sebastián E. Godoy, Patricia Marshik, Ramesh Chand, Jason McConville, Sanjay Krishna, Sanchita Krishna, and Pavan Muttill, "Metered Dose Inhalers: Varying the time between multiple actuations could influence the emitted dose," 2013 American College of Clinical Pharmacy (ACCP) Annual Meeting, Albuquerque, NM. October 13-16, 2013
 13. Zhaobing Tiang, Ted Schuler-Sandy, Sebastián E. Godoy, H. S. Kim and Sanjay Krishna, "High-operating-temperature MWIR detectors using type II superlattices," Proc. SPIE 8867, Infrared Remote Sensing and Instrumentation XXI, 88670S (September 19, 2013) DOI: 10.1117/12.2024587
 14. Zhaobing Tiang, Ted Schuler-Sandy, Sebastián E. Godoy, H. S. Kim, John Montoya, Stephen Myers, Brianna Klein, Elena Plis and Sanjay Krishna, "Quantum-engineered mid-infrared type-II InAs/GaSb superlattice photodetectors for high temperature operations," Proc. SPIE 8704, Infrared Technology and Applications XXXIX, 87041T (June 18, 2013), SPIE Defense, Security, and Sensing, 2013, Baltimore, Maryland, United States. DOI: 10.1117/12.2016125
 15. Julia Hautmann, Sebastián E. Godoy, P. Marshik, R. Chand, J. McConville, Sanchita Krishna, Sanjay Krishna, and Pavan Muttill, "Effect of Time Between Actuation on the Dose Variability for Three Metered Dose Inhalers," RDD Europe (2013), vol. 2, pp.429-434. Respiratory Drug Delivery (RDD) Europe 2013 was held at the Hotel Intercontinental in Berlin, Germany, May 21-24, 2013.
 16. Sebastián E. Godoy, Majeed M. Hayat, Woo-Yong Jang and Sanjay Krishna, "Classifier-enhanced algorithm for compressive spatio-spectral edge detection," 2012 IEEE Photonics Conference (IPC), 23-27 September 2012, San Francisco, CA, USA DOI: 10.1109/IPCon.2012.6358757
 17. Woo-Yong Jang, Majeed M. Hayat, Sebastián E. Godoy and Payman Zarkesh-Ha, "Compressive Multispectral Sensing Algorithm with Tunable Quantum Dots-in-a-Well Infrared Photodetectors," 2011 IEEE Photonics Conference (PHO), p. 147-148, 9-13 October 2011 at Marriott Crystal Gateway, Arlington, VA, USA. DOI: 10.1109/PHO.2011.6110468
 18. Pablo F. Meza, Esteban M. Vera, Sergio N. Torres, and Sebastián E. Godoy, "A new Reference-Free Infrared Image Quality Metric for Nonuniformity Correction," In Proc. The 14th World Multi-Conference on. Systemics, Cybernetics and Informatics: WMSCI 2010. June 29th - July 2nd, 2010, Orlando, FL, USA.
 19. Sebastián E. Godoy, Sergio N. Torres, Jorge E. Pezoa, Majeed M. Hayat and Qi Wang, "Nonuniformity correction algorithm based on a noise-cancellation system

for infrared focal-plane arrays," Proc. SPIE, Vol. 6542, 65423S (2007), DOI: 10.1117/12.719924

TEACHING

Teaching interests

Signals and systems, digital and analog communications, signal detection and estimation, photonic devices and systems, optoelectronic devices, information theory, digital signal processing, digital image processing, pattern recognition, algorithms for spectral sensing and imaging, probability theory and stochastic processes, linear systems.