

Jorge F. Silva
Associate Professor
Information and Decision Systems Group
Department of Electrical Engineering
Faculty of Physics and Mathematical Sciences
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Education

University of Southern California Fall 2003—Fall 2008
(PhDEE) Doctor of Philosophy in Electrical Engineering.
Thesis Title: “*On Optimal Signal Representation for Statistical Learning and Pattern Recognition*”.

University of Southern California Fall 2003—Spring 2005
(MSEE) Master of Science in Electrical Engineering.

Universidad de Chile 1999— January 2002
Engineer degree in Electrical Engineering, Santiago, Chile.
Title: “*Modeling and Adaptation of the State Duration Distribution for Automatic Speech Recognition System*”.

Universidad de Chile 1996—1999
Bachelor of Engineering in Electrical Engineering, Santiago, Chile.

Professional Experience

Universidad de Chile March 2015— present
Associate Professor, Department of Electrical Engineering.

Universidad de Chile December 2009— March 2015
Assistant Professor, Department of Electrical Engineering.

University of Southern California Augusts 2003— November 2009
Research Assistant in the Signal Analysis and Interpretation Laboratory (SAIL), Department of Electrical Engineering.

Microsoft Research May 2005—August 2005.
Research Intern 2005 in the Speech Research Group, Microsoft Corporation. Working on pruning techniques and metadata integration for soft indexing in spoken document retrieval, and formulation of distance measures for evaluating retrieval performance.

Universidad de Chile March 2000—July 2003
Research Assistant in the Speech Processing and Transmission Laboratory (LPTV), Department of Electrical Engineering. Working on robust speech recognition, state duration distribution analysis and developing speaker adaptation techniques.

Universidad de Chile January 2002—July 2003
Part-time lecturer at the Department of Electrical Engineering. Lecturing undergraduate courses in digital signal processing and computer architecture and collaborating in

the design of experimental activities in the framework of a “Integrated Lab of Electrotechnologies for Engineering Education”, project funded by the Chilean Education Secretary.

Distinctions

April, 2019
Elevation to the grade of IEEE Senior member. IEEE Senior Membership is an honor bestowed only to those who have made significant contributions to the profession. Given by IEEE Advancement Committee.

January, 2016
Nominated Associate Editor (AE) of the IEEE Transactions on Signal Processing.

May, 2013
Recognition for being the author of one of the Top 25 papers published in Speech Communication in 2012. Recognized by ScienceDirect, ELSEVIER.¹

May, 2013
Outstanding research recognition for publishing in the top 10 percent of the most influential Electrical Engineering ISI journals during 2012. Award given by the Dean of the Universidad de Chile in the opening academic ceremony for the year 2013.

May, 2009
USC Outstanding Thesis Award Theoretical Research. Given by the Viterbi School of Engineering, University of Southern California.

2007-2008
Viterbi Doctoral Fellowship, University of Southern California. Founded by Simon Ramo Scholarship and Kunzel Foundation Fellowship.

2003-2004, 2004-2005
Teacher Assistantship Position, Viterbi School of Engineering, University of Southern California.

2002
Graduated with the highest honors, ranked 6th among the 512 students at the Faculty of Physical and Mathematical Sciences, University of Chile.

1996, 1997, 2000, 2001.
Honor’s roll student, top 5 percent, at the Faculty of Physical and Mathematical Sciences, University of Chile.

Research Projects

2017-2021
Topics on Information and Decision with Applications to Coding and Inverse Problems in Astronomy, **Fondecyt Regular Grant 1170854**, Agency Conicyt-Chile, Principal Investigator.

2017-2021
Prognostics Performance Metrics based on Bayesian Cramer-Rao Lower Bounds, **Fondecyt Regular Grant 1170044**, Agency Conicyt-Chile, Co-investigator (Co-PI), PI Marcos E. Orchard.

2017-2021
Characterizing the causal rate-distortion function and extensions to networked control problems, **Fondecyt Regular Grant 1171059**, Agency Conicyt-Chile, Co-investigator (Co-PI), Pi. Milan S. Derpich.

2015-2018

¹<http://top25.sciencedirect.com/subject/engineering/12/journal/speech-communication/01676393/archive/42/>

Information and Decision Theory Applied to the Measurement of Quantities of Astronomical Interest: The case of Ground-and Space-based Astrometry and Photometry, **Fondecyt Regular Grant 1151213**, Agency Conicyt-Chile, Co-investigator (Co-PI), PI Ren Mendez.

2016-2018

Conicyt PIA ACT1405, Procesos fundamentales en fisica de plasmas espaciales combinando instrumentacin, observaciones, teora y simulaciones, Programa de Investigacin Asociativa, CONICYT. Director: Juan Valdivia. Associate Researcher.

2014-2016

Topics on Signal and Information Processing: Theory and Applications to Geological Image Reconstruction, **Fondecyt Regular Grant 1140840**, Agency Conicyt-Chile, Principal investigator (PI).

2014-2015

Empaquetamiento y transferencia de un Sistema de Exploracin Minera y Geotermica basado en tomografia ssmica, **14IDL4-30327**, CORFO, Empaquetamiento y Transferencia de I+D, Co-investigator (Co-PI), Director: Diana Comte.

2014-2016

Novel Estimation and Prognosis techniques for the analysis of state-of-charge and state-of-health degradation in energy storage devices, **Fondecyt Regular Grant 1140774**, Agency Conicyt-Chile, Co-investigator (Co-PI).

2014-2016

Fundamental Limitations and Optimal Design of Small-Delay Signal Transmission Systems, **Fondecyt Regular Grant 1140384**, Agency Conicyt-Chile, Co-investigator (Co-PI).

2011-2015

Compressed Sensing applied to Permeability Fied Reconstruction, Proyecto Basal AMTC, Agency Conicyt-Chile, Associate investigator.

2011-2013

Universal Estimation of Information Measures and Applications, **Fondecyt Regular Grant 1110145**, Agency Conicyt-Chile, Principal investigator (PI).

2012-2012

A probabilistic approach to stomate the state of charge and state of health Ion-Litio Batteries, **CORFO Project 11IDL1-10409**, Agency Corfo-Chile, Co-director.

2009-2010

Optimal Signal Representation: Formulations, Algorithms and Applications to Speech Recognition and Non-parametric Mutual Information Estimation, **Fondecyt Regular Grant 1090138**, Agency Conicyt-Chile, Principal investigator (PI).

Professional Activities

Member of IEEE *Signal Processing* and IEEE *Information Theory* Societies.

Associate Editor (AE) of the IEEE Transactions on Signal Processing: February 2016-February 2018.

Reviewer for: IEEE *Transactions on Signal Processing*; IEEE *Transactions on Information Theory*, IEEE *Signal Processing Letters*; IEEE *Transactions on Image Processing*; IEEE *Transaction on Speech and Audio Processing*; Journal of Machine Learning Research; ELSEVIER *Information Sciencies*; ELSEVIER *Journal of Statistical Planning and Inference*; ELSEVIER *Computer, Speech and Language*; and ELSEVIER *Speech Communication*.

1. Hernan Calderon, **Jorge F. Silva**, Felipe Santibanez, Julin M. Ortiz, and Alvaro Egana, “Geological Facies Reconstruction Based on Weighted ℓ_1 -Regularization,” under review: *Mathematical Geosciences*, February, 2018.
2. **Jorge F. Silva** and Pablo Piantanida, “Universal Weak Variable-Length Source Coding on Countable Infinite Alphabets,” under review: *IEEE Transactions on Information Theory*, August, 2017.
3. **Jorge F. Silva**, “Compressibility Analysis of Asymptotically Mean Stationary Processes,” under review: *Applied and Computational Harmonic Analysis*, January, 2019.

International Journals

1. Ruben Claveria, Rene A. Mendez, Marcos E. Orchard and **Jorge F. Silva**, “Visual binary stars with partially missing data: Introducing multiple imputation in astrometric analysis,” *Publications of the Astronomical Society of the Pacific (PASP)*, accepted, May, 2019.
2. Felipe Santibanez-Leal, **Jorge F. Silva** and Julian Ortiz, “Well Placement Strategies for Uncertainty Reduction in Categorical Random Fields: Formulation, Mathematical Analysis and Application to Multiple-Point Simulations,” *Mathematical Geosciences*, January, 2019, <https://doi.org/10.1007/s11004-018-09777-2>.
3. **Jorge F. Silva** and Milan S. Derpich, “Fixed-Rate Universal Lossy Source Coding and Model Identification: Connection with Zero-Rate Density Estimation and the Skeleton Estimator,” *Entropy*, 20, 640, August, 2018.
4. **Jorge F. Silva**, “Shannon Entropy Estimation in ∞ -Alphabets from Convergence Results: Studying Plug-in Estimators,” *Entropy*, 20(6), 397, May, 2018.
5. Sebastian Espinosa, **Jorge F. Silva**, Rene A. Mendez, Rodrigo Lobos, Marcos E. Orchard, “Optimality of the maximum likelihood estimator in astrometry,” *Astronomy & Astrophysics (A&A)*, vol. 616, August 2018.
6. Felipe Tobar, Ivan Castro, **Jorge F. Silva** and Marcos E. Orchard, “Improving battery voltage prediction in an electric bicycle using altitude measurements and kernel adaptive filters,” *Pattern Recognition Letter*, vol. 105, no. 1, pp. 200-206, April 2018.
7. Rene A. Mendez, Ruben M. Claveria, Marcos E. Orchard, **Jorge F. Silva**, “Orbits for 18 Visual Binaries and Two Double-line Spectroscopic Binaries Observed with HRCAM on the CTIO SOAR 4 m Telescope, Using a New Bayesian Orbit Code Based on Markov Chain Monte Carlo,” *The Astronomical Journal*, 154:187 (22pp), November, 2017.
8. Rodrigo Chi-Duran, Diana Comte, Marcos Diaz and **Jorge F. Silva**, “Automatic detection of P- and S-wave arrival times: new strategies based on the modified fractal method and basic matching pursuit,” *Journal of Seismology*, 21(4):1-14, May, 2017.
9. Alex Echeverria, **Jorge F. Silva**, Rene A. Mendez, and Marcos E. Orchard, “Analysis of the Bayesian Cramer-Rao lower bound in astrometry: Studying the impact of prior information in the location of an object,” *Astronomy & Astrophysics (A&A)*, vol. 594, A111, 2016.

10. Rodrigo Lobos, **Jorge F. Silva**, Julian M. Ortiz, Gonzalo Diaz, Alvaro Egana, "Analysis and Classification of Natural Rock Textures based on New Transform-based Features," *Mathematical Geosciences*, vol. 48, pp. 835 - 870, July, 2016.
11. M. Diaz, J.C. Zagal, C. Falcon, M. Stepanova, J.A. Valdivia, M. Martinez-Ledesma, J. Diaz, F.R. Jaramillo, N. Romanova, E. Pacheco, M. Milla, M. Orchard, **J. F. Silva** and F.P. Mena, "New opportunities offered by cubesats for space research in Latin America: the SUCHAI project case", *Advances in Space Research*, vol. 58, issue 10, 2016.
12. Rodrigo Lobos, **Jorge F. Silva**, Rene A. Mendez, and Marcos E. Orchard , "Performance analysis of the Least-Squares estimator in Astrometry," *Publications of the Astronomical Society of the Pacific (PASP)*, vol. 127: pp. 1166-1182, Nov. 2015.
13. Hernan Calderon, **Jorge F. Silva**, Julian M. Ortiz, and Alvaro Egana, "Reconstruction of Multichannel Facies based on RIPLess Compressed Sensing," *Computers and Geosciences*, vol. 77, pp. 54-65, April, 2015.
14. **Jorge F. Silva** and Milan S. Derpich, "On the Characterization of ℓ_p -Compressible Ergodic Processes," *IEEE Transactions on Signal Processing*, vol. 63, no. 11, pp. 2915-2928, June, 2015.
15. Marcos E. Orchard, Matias Lacalle, Benjamin Olivares, **Jorge F. Silva**, Rodrigo Palma, Pablo Estevez, Bernardo Severino, Williams Calderon-Muoz and Marcelo Cortez, "Information-Theoretic Measures and Sequential Monte Carlo Methods for Detection of Regeneration Phenomena in the Degradation of Lithium-Ion Battery Cells," *IEEE Transactions on Reliability*, vol. 64, issue 2, pp. 710-720, June 2015.
16. Daniel A. Pola, Hugo F. Navarrete, Ricardo S. Rabi, Matas A. Cerda, Benjamn E. Olivares, Marcos E. Orchard, and **Jorge F. Silva**, "Particle-filtering-based Discharge Time Prognosis for Lithium-Ion Batteries with a Statistical Characterization of Use Profiles," *IEEE Transactions on Reliability*, vol. 64, issue 2, pp. 701-709, June 2015..
17. David Acuna. Marcos E. Orchard, **Jorge F. Silva** and Aramis Perez., "Multiple-imputation-particle-filtering for Uncertainty Characterization in Battery State-of-Charge Estimation Problems with Missing Measurement Data: Performance Analysis and Impact on Prognostic Algorithms," *International Journal of Prognostics and Health Management*, vol. 6, (008), pp. 1-12, 2015.
18. Rene Mendez, **Jorge F. Silva**, Rodrigo Orostica, and Rodrigo Lobos, "Analysis of the Cramer-Rao lower-bound in the joint estimation of astrometry and photometry," *Publications of the Astronomical Society of the Pacific (PASP)*, vol. 126, August, 2014.
19. Karel Mundnich, Marcos E. Orchard, **Jorge F. Silva**, and Patricio Parada, "Volatility Estimation of Financial Returns using Risk-Sensitive Particles Filters," *Studies in Informatics and Control*, vol. 22, no. 3, pp. 297-306, September, 2013.
20. Rene Mendez, **Jorge F. Silva** and Rodrigo Lobos, "Analysis and interpretation of the Cramer-Rao lower-bound in astrometry: One dimensional case, *Publications of the Astronomical Society of the Pacific*, vol. 125, pp. 580594, May, 2013.
21. Benjamn Olivares, Matas Cerda, Marcos Orchard, and **Jorge F. Silva**, "Particle-filtering-based Prognosis Framework for Energy Storage Devices with a Statistical Characterization of State-of-Health Regeneration Phenomena," *IEEE Trans. on Instr. & Measurement Decision*, vol. 62, issue 2, pp. 364 - 376, February, 2013.

22. **Jorge F. Silva** and Patricio Parada, "On the Convergence of Shannon Differential Entropy, and its Connections with Density and Entropy Estimation," *ELSEVIER Journal of Statistical Planning and Inference*, vol. 142, issue 7, pp. 1716-1732, July, 2012.
23. Eduardo Pavez and **Jorge F. Silva**, "Analysis and Design of Wavelet-Packet Cepstral Coefficients for Automatic Speech Recognition," *ELSEVIER Speech Communication*, vol. 54, issue 6, pp. 814-835, July, 2012.
24. **Jorge F. Silva** and Shrikanth S. Narayanan, "On Signal Representations within the Bayes Decision Framework," *ELSEVIER Pattern Recognition*, vol. 45, issue 5, pp. 1853 - 1865, 2012.
25. **Jorge F. Silva** and Shrikanth S. Narayanan, "Complexity-Regularized Tree-Structured Partition for Mutual Information Estimation," *IEEE Transactions on Information Theory*, vol. 58, no. 3, pp.1940 - 1952, March, 2012.
26. Marcos Orchard, Matias Cerda, Benjamin Olivares and **Jorge F. Silva**, "Sequential Monte Carlo Methods for Discharge Time Prognosis in Lithium-Ion Batteries," *International Journal of Prognostics and Health Management*, vol. 3, issue 2 (010), pp. 1-12, 2012.
27. **Jorge F. Silva** and Shrikanth S. Narayanan, "Information Divergence Estimation based on Data-Dependent Partitions," *ELSEVIER Journal of Statistical Planning and Inference*, vol. 140, pp. 3130-3198, November, 2010.
28. **Jorge F. Silva** and Shrikanth S. Narayanan, "Non-Product Data-Dependent Partitions for Mutual Information Estimation: Strong Consistency and Applications," *IEEE Transactions on Signal Processing*, vol. 58, no. 7, pp. 3497 - 3511, July, 2010.
29. **Jorge F. Silva** and Shrikanth S. Narayanan, "Discriminative Wavelet Packet Filter Bank Selection for Pattern Recognition," *IEEE Transactions on Signal Processing*, vol. 57, issue 5, pp.1796-1810, May, 2009.
30. **Jorge F. Silva** and Shrikanth S. Narayanan, "Upper Bound Kullback-Leibler Divergence for Transient Hidden Markov Models," *IEEE Transactions on Signal Processing*, vol. 56, issue 9, pp. 4176-4188, September, 2008.
31. Ciprian Chelba, **Jorge F. Silva** and Alex Acero, "Soft Indexing of Speech Content for Search in Spoken Documents, Elsevier Computer Speech and Language, vol. 21, issue 3, pp. 458-478, July, 2007.
32. **Jorge F. Silva** and Shrikanth S. Narayanan, "Average Divergence Distance as a Statistical Discrimination Measure for Hidden Markov Models," *IEEE Transactions on Audio, Speech and Language Processing*, vol. 14, issue 3, pp. 890 - 906, May, 2006.
33. N.B. Yoma, C. Molina, **J. F. Silva**, C. Busso, "Modeling, Estimating and Compensating low-bit rate Coding Distortion in Speech Recognition," *IEEE Transactions on Audio, Speech and Language Processing*, vol. 14, issue 1, pp. 223 - 231, January, 2006.
34. N.B. Yoma, **J. Silva**, C. Busso, and I. Brito, "Compensating Additive Noise and CS-CELP distortion in speech recognition using stochastic weighted Viterbi algorithm," *IEE Electronic Letters*, vol. 39, no. 4, February, 2003.

35. N.B. Yoma, and **J. Silva-Sanchez**, "MAP Speaker Adaptation of State Duration Distribution for Speech Recognition," *IEEE Transactions on Speech and Audio Processing*, vol. 10, no. 7, pp. 443 - 450, October, 2002.

International Conferences

1. S. Espinosa, J. F. Silva, R. A. Mendez and M. Orchard, "The Bayesian Cramer-Rao Lower Bound in Photometry," in *RevMexAA (Serie de Conferencias)*, 50, 5051, 2018.
2. R. A. Mendez, A. Echeverria, J. F. Silva, and M. Orchard, "The Bayesian Cramer-Rao Lower Bound in Astrometry," in *RevMexAA (Serie de Conferencias)*, Vol. 50, pp. 23-24, 2018.
3. J. F. Silva and P. Piantanida, "The Redundancy Gains of Almost Lossless Universal Source Coding over Envelope Families," in *IEEE International Symposium on Information Theory, Aachen*, July, 2017.
4. R. A. Mendez, A. Echeverria, J. F. Silva, and M. Orchard, "The Bayesian Cramer-Rao Lower Bound in Astrometry," in *RevMexAA (Serie de Conferencias)*, 49, 5252, 2017.
5. L. Araya-Hernandez, J. F. Silva, A. Osses, F. Tobar "A Bayesian mixture-of-Gaussians model for astronomical observations in interferometry," *Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON)*, October, 2017.
6. A. Perez, F. Cornejo, M. E. Orchard and J. F. Silva "Dynamic Vector Model Applied to Wind Speed Prognosis for Eolic Generation," *Third European Conference of the Prognostics and Health Management Society (PHM) 2016*, Denver, Colorado, October, 2016.
7. R. M. Claveria, D. Acuna, R. A. Mendez, J. F. Silva and M. E. Orchard "Application of Multiple-imputation-particle-filter for Parameter Estimation of Visual Binary Stars with Incomplete Observations," *Annual Conference of the Prognostics and Health Management Society (PHM) 2016*, Denver, Colorado, October, 2016.
8. S. Espinosa, J. F. Silva, R. A. Mendez, and M. E. Orchard "Analysis of the Bayesian Cramer-Rao Lower Bound in Photometry: Studying Achievability," in *ADeLA 2016 (VII Reunion de Astronomia Dinamica en Latinoamerica)*, 2016.
9. A. Echeverria, J. F. Silva, R. A. Mendez, and M. E. Orchard, "The Bayesian Cramer-Rao lower bound in Astrometry," in *ADeLA 2016 (VII Reunion de Astronomia Dinamica en Latinoamerica)*, 2016.
10. J. F. Silva and P. Piantanida, "Almost Lossless Variable-Length Source Coding on Countably Infinite Alphabets," in *IEEE International Symposium on Information Theory, Barcelona, Spain*, July, 2016.
11. A. Echeverria, J.F. Silva, R. Mendez and M. Orchard, "Analysis of the Bayesian Cramer-Rao in Astrometry," *IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM)*, Sao Paulo, Brasil, July, 2016.
12. H. Calderon, F. Santibanez, J. F. Silva , J. M. Ortiz, and A. Egana, "Channelized Facies Recovery based on Weighted Compressed Sensing," in *IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM)*, Sao Paulo, Brasil, July, 2016.

13. C. Tampier, A. Perez, F. Jaramillo, V. Quintero, M. Orchard, and J. F. Silva, "Lithium-Ion Battery End-of-Discharge Time Estimation and Prognosis based on Bayesian Algorithms and Outer Feedback Correction Loops: A Comparative Analysis," in the Annual Conference of the Prognostic and Health Management Society 2015, October 19th-24th, San Diego, CA, USA, 2015.
14. R. Mendez and J. F. Silva, "Information and Decision Theory as applied to astronomy: The case of astrometry and photometry," in ADeLA 2015 (VI Reunion de Astronomia Dinamica en Latinoamerica), Vol. 46, pp. 77–78, 2015.
15. J. F. Silva and M. S. Derpich, "Precise best k-term Approximation Error Analysis of Ergodic Processes," in the IEEE International Symposium on Information Theory, Honolulu, Hawaii, USA, 2014.
16. D. Acuna, M. Orchard, J. F. Silva and A. Perez, "Multiple-imputation-particle-filtering scheme for Uncertainty Characterization in Battery State-of-Charge Estimation Problems with Missing Measurement Data," in the Annual Conference of the PHM Society 2014, Fort Worth, TX, USA, September 29th - October 2nd, 2014.
17. J. F. Silva and P. Parada, "Shannon Entropy Estimation from Convergence Results in the Countable Alphabet Case," in IEEE Information Theory Workshop (ITW2013), Sevilla, Espana, 2013.
18. M. Orchard, M. Lacalle, B. Olivares, M. Cerda, and J. F. Silva, "Information-Theoretic Measures and Sequential Monte Carlo Methods for Detection of Regeneration Phenomena in the Degradation of Energy Storage Devices," in the Prognostics and System Health Management Conference, Milano, Italy, 8-11 September 2013.
19. J. F. Silva and E. Pavez, "Compressibility of Infinite Sequences and its Interplay with Compressed Sensing Recovery," in APSIPA, Los Angeles, USA, 2012.
20. J. F. Silva and P. Parada, "Shannon Entropy Convergence Results in the Countable Infinite Case," in IEEE International Symposium on Information Theory (ISIT2012), Boston, USA, 2012
21. M. Orchard, B. Olivares, M. Cerda, and J. F. Silva, "Anomaly Detection Based on Information-Theoretic Measures and Particle Filtering Algorithms" in IEEE International Conference on Prognostics and Health Management, Denver, Colorado, USA, 2012.
22. J. F. Silva and P. Parada, "Sufficient Conditions for the Convergence of the Shannon Differential Entropy," in IEEE Information Theory Workshop (ITW2011), Paraty, Brasil, 2011.
23. J. F. Silva and M. S. Derpich, "Necessary and Sufficient Conditions for Zero-Rate Density Estimation," in IEEE Information Theory Workshop (ITW2011), Paraty, Brasil, 2011.
24. M. Orchard, J.F. Silva, and L. Tang, "A Probabilistic Approach for Online Model-based Estimation of SOH/SOC and use profile characterization for Li-Ion Batteries, Annual Conference of the Prognostics and Health Management Society 2011, September 25th-29th 2011, Montreal, QB, Canada.
25. J. F. Silva and S. Narayanan, "A Near-Optimal (Minimax) Tree-Structured Partition for Mutual Information Estimation," in IEEE International Symposium on Information Theory, Texas, Austin, 2010.

26. J. F. Silva and S. Narayanan, "On Data-Driven Histogram-Based Estimation for Mutual Information," in IEEE International Symposium on Information Theory, Texas, Austin, 2010.
27. J. F. Silva and S. Narayanan, "Histogram-Based Estimation for the Divergence Revisited," in IEEE International Symposium on Information Theory, Seoul, Korea, 2009.
28. J. F. Silva and S. Narayanan, "Minimum Probability of Error Signal Representation," in IEEE International Workshop on Machine Learning for Signal Processing, Thessaloniki, Greece, 2007.
29. J. F. Silva and S. Narayanan, "Universal Consistency of Data-Driven Partitions for Divergence Estimation," in IEEE International Symposium on Information Theory, Nice, France, 2007.
30. J. F. Silva and S. Narayanan, "Optimal Wavelet Packets Decomposition based on a Rate-Distortion Optimality Criterion," in IEEE International Conference on Acoustics, Speech, and Signal Processing ICASSP, Hawaii, USA, 2007.
31. J. F. Silva, V. Rangarajan, V. Rozgic and S. Narayanan, "Information Theoretic Analysis of Direct Articulatory Measurements for Phonetic Discrimination," in IEEE International Conference on Acoustics, Speech, and Signal Processing ICASSP, Hawaii, USA, 2007.
32. J. F. Silva and S. Narayanan, "Upper Bound Kullback-Leibler Divergence for Hidden Markov Models with Application as Discrimination Measure for Speech Recognition," in IEEE International Symposium on Information Theory, Seattle, WA 2006.
33. J. F. Silva, C. Chelba and A. Acero, "Integration of Metadata in Spoken Document Search Using Position Specific Posterior Lattices," in IEEE International Workshop on Spoken Language Technology, Aruba, 2006.
34. J. F. Silva, C. Chelba and A. Acero, "Pruning Analysis of the Position Specific Posterior Lattices for Spoken Document Search," in ICASSP, Toulouse, France, 2006.
35. J. Tepperman, J. F. Silva, A. Kazemzadeh, H. You, S. Lee, A. Alwan, and Shrikanth Narayanan "Pronunciation verification of childrens speech for automatic literacy assessment," in Proc. of InterSpeech ICSLP, Pittsburgh, PA, 2006.
36. J. Tepperman, J. F. Silva, A. Sethy, and S. Narayanan. "Robust recognition and assessment of non-native speech variability," in Proc. of Int. Conference on Int. Syst. and Comp.: Theory And Applications, Ayia Napa, Cyprus, 2006.
37. A. Kazemzadeh, J. Tepperman, J. F. Silva, H.You, S. Lee, A. Alwan and S. S. Narayanan, "Automatic detection of voice onset time contrasts for use in pronunciation assessment," in Proceedings of InterSpeech, 2006.
38. J. F. Silva and S. Narayanan, "A Statistical Discrimination Measure for Hidden Markov Models based on Divergence," in ICSLP October 2004.
39. N. Mote, L. Johnson, A. Sethy, J. F. Silva and S. S. Narayanan, "Tactical language detection and modeling of learner speech errors: The case of Arabic tactical language training for American English speakers," in Proceedings of the INSTIL/ICALL Symposium, 2004.

40. N. B. Yoma, I. Brito, and J. F. Silva, "Language model accuracy and uncertainty in noise cancelling in the stochastic weighted Viterbi algorithm," Interspeech, ISCA, 2003.
41. N. B. Yoma and J. F. Silva, "Speaker adaptation of output probabilities and state duration distributions for speech recognition," pp. 1257-1260, Interspeech 2001.

Technical Reports

1. Jorge F. Silva and Eduardo Pavez, "On ℓ_1 -Compressibility of Infinite Sequences: Connections with Compressed Sensing Performance Recovery" IDS Technical Report, University of Chile, August, 2012.
2. Jorge F. Silva and Shrikanth S. Narayanan, "Supplemental Material: Discriminative Wavelet Packet Filter Bank Selection for Pattern Recognition," Technical Report, Department of Electrical Engineering, Universidad de Chile, 2009. (200.9.100.182/ josilva/journals/supplemental-silva-narayanan-ieee-sp-2009.pdf)
3. J. Silva, C. Chelba and A. Acero, "Pruning analysis of the Position Specific Posterior Lattices for Spoken Document Search," Internal report, Microsoft Research Group, Microsoft Corporation, August 2005.
4. J. Silva, C. Chelba and A. Acero, "Integration of Metadata in Spoken Document Search Using Position Specific Posterior Lattices," Internal report, Microsoft Research Group, Microsoft Corporation, August 2005.

Patents

1. Shrikanth Narayanan, Abbinav Sethy, Jorge Silva, J. Tepperman, "New methods for building computer assisted pronunciation assessment systems for language acquisition". (Disclosed/Licensed, 2005)
2. Alex Acero, Ciprian Chelba, Jorge Silva Sanchez, "Speech Index Pruning ," application number 20070106512, Filed: Nov 09, 2005, Issued: May 10, 2007, Patent Grant number: 7831428, Assignee: Microsoft Corporation (Redmond, WA). Current U.S. Class: 704/260.000 International Classification: G10L 13/08 (20060101).
3. Alex Acero, Ciprian Chelba, Jorge Silva Sanchez, "Indexing and searching speech with text meta-data," Application number: 20070106509, Filed: Nov 08, 2005, Issued: May 10, 2007, Patent Grant number: 7809568, Assignee: Microsoft Corporation (Redmond, WA). Current U.S. Class: 704/240.000, International Classification: G10L 15/00 (20060101).

Teaching

Estimation and Detection: Lecturer, Dept. of Electrical Engineering, Universidad de Chile (Spring 2012, Fall 2013).

Information Theory: Lecturer, Dept. of Electrical Engineering, Universidad de Chile (Spring 2011, Fall 2014).

Statistical Signal Processing: Lecturer, Dept. of Electrical Engineering, Universidad de Chile (Spring 2010, Fall 2011).

Signal Processing: Lecturer, Dept. of Electrical Engineering, Universidad de Chile (Fall 2010, Spring 2013).

Principle of Digital Communication: Lecturer, Dept. of Electrical Engineering, Universidad de Chile (Spring 2009).

Random Processes: Teaching Assistant, Dept. of Electrical Engineering, University of Southern California (Spring 2005).

Digital Signal Processing: Teaching Assistant, Dept. of Electrical Engineering, University of Southern California (Spring 2004).

Transformation Theory: Teaching Assistant, Dept. of Electrical Engineering, University of Southern California (Fall 2003 and Fall 2004).

Computer Architecture: Lecturer, Dept. of Electrical Engineering, University of Chile (Spring 2002 and Spring 2003).

Digital Signal Processing: Lecturer, Dept. of Electrical Engineering, Universidad de Chile (Fall 2002).

Talks

“*The Redundancy Gains of Almost Lossless Universal Source Coding over Envelope Families,*” at the IEEE International Symposium on Information Theory, Aachen, Germany, 2017.

“*Almost Lossless Variable-Length Source Coding on Countably Infinite Alphabets,*” at the IEEE International Symposium on Information Theory, Barcelona, Spain, 2016.

“*Precise best k -term Approximation Error Analysis of Ergodic Processes,*” at the IEEE International Symposium on Information Theory, Honolulu, Hawaii, USA, 2014.

“*Shannon Entropy Estimation from Convergence Results in the Countable Alphabet Case,*” at the IEEE Information Theory Workshop (ITW2013), Sevilla, Espana, 2013.

“*Compressibility of Infinite Sequences and its Interplay with Compressed Sensing Recovery,*” at APSIPA, Los Angeles, USA, 2012

“*Shannon Entropy Convergence Results in the Countable Infinite Case,*” at the IEEE International Symposium on Information Theory, MIT, Boston, 2012.

“*On the estimation of information measures: Technical Challenges and Applications,*” Invited Speaker, (EVIC 2012, www.evic.cl/2012/), Universidad de Chile, 10 al 12 de Diciembre 2012.

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