Rodrigo A. Lobos

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University of Southern California, University Park Campus
3740 S. McClintock Avenue, Ronald Tutor Hall (RTH) #317

EDUCATION

University of Southern California (USC), Los Angeles, CA — Aug. 2015 - Present
Ph.D., Electrical Engineering
- Advisor: Professor Justin P. Haldar

University of Southern California (USC), Los Angeles, CA — December 2020
M.A., Applied Mathematics

Universidad de Chile, Santiago, Chile — July 2015
M.Sc., Electrical Engineering
- Thesis: *Application of signal processing tools in natural rock textures characterization and astrometry*
- Advisor: Professor Jorge F. Silva

Universidad de Chile, Santiago, Chile — July 2013
Electrical engineering professional title
(Equivalent to B.Sc. and M.Sc. in Electrical Engineering)

RESEARCH INTERESTS

MRI reconstruction; Tomographic reconstruction; Biomedical imaging; Computational imaging; Statistical signal and image processing; Inverse problems

CONFERENCE PAPER AWARDS

Best Paper Award Finalist — 2020
IEEE International Symposium on Biomedical Imaging (ISBI)
11 papers were selected out of 747 submissions

Summa Cum Laude Abstract Award (top 3%) — 2017
International Society for Magnetic Resonance in Medicine
Featured with a Power Pitch presentation (hand-selected as one of the 220 most interesting abstracts out of 6,780 submissions to the conference)

GRADUATE SCHOOL AWARDS AND FELLOWSHIPS

Selected as a Ming Hsieh Institute Ph.D. Scholar — 2021
University of Southern California

Best Teaching Assistant Recognition Award — 2021
University of Southern California

Best Master's Thesis in Electrical Engineering — 2015
Universidad de Chile

Outstanding Graduate Student Award — 2015
Award given by The School of Engineers of Chile.
Best graduate student in Electrical Engineering at Universidad de Chile in 2015

Master's Degree Fellowship 2013

Given by CONICYT-Chile (National Commission for Scientific and Technological Research)

JOURNAL PUBLICATIONS

[J9] **R. A. Lobos**, M. U. Ghani, W. C. Karl, R. M. Leahy, J. P. Haldar. "Autoregression and Structured Low-Rank Modeling of Sinogram Neighborhoods.", *IEEE Transactions on Computational Imaging*, vol. 7, no. 6: pp. 1044-1054, September, 2021

[J8] **R. A. Lobos**, W. S. Hoge, A. Javed, C. Liao, K. Setsompop, K. S. Nayak, J. P. Haldar. "Robust Autocalibrated Structured Low-Rank EPI Ghost Correction.", *Magnetic Resonance in Medicine*, vol. 85, no.6: pp. 3404-3419, June, 2021.

[J7] Gonzalo Díaz, Julián M. Ortiz, Jorge F. Silva, **Rodrigo A. Lobos** and Alvaro Egaña, "Variogram-Based Descriptors for Comparison and Classification of Rock Texture Images", *Mathematical Geoscience*, vol. 52, no. 4: pp. 451-476, May, 2020.

[J6] Sebastián Espinosa, Jorge F. Silva, Rene A. Mendez, **Rodrigo Lobos** and Marcos E. Orchard, "Optimality of the maximum likelihood estimator in astrometry", *Astronomy & Astrophysics*, vol. 616, August, 2018.

[J5] **R. A. Lobos**, T. H. Kim, W. S. Hoge, J. P. Haldar, " Navigator-free EPI Ghost Correction with Structured Low-Rank Matrix Models: New Theory and Methods.", *IEEE Transactions on Medical Imaging*, vol. 37, no. 11: pp. 2390-2402 , Nov. 2018.

[J4] **Rodrigo A. Lobos**, Jorge F. Silva, Julián M. Ortiz, Gonzalo Díaz and Alvaro Egaña, "Analysis and Classification of Natural Rock Textures based on New Transform-based Features", *Mathematical Geoscience*, vol. 48, no. 7: pp. 835-870, October, 2016.

[J3] **Rodrigo A. 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. 580-594, November, 2015.

[J2] Rene Mendez, Jorge F. Silva, Rodrigo Orostica, and **Rodrigo Lobos**, "Analysis of the Cramér-Rao lower-bound in the joint estimation of astrometry and photometry", *Publications of the Astronomical Society of the Pacific* (PASP), vol. 126, August, 2014.

[J1] Rene Mendez, Jorge F. Silva and **Rodrigo Lobos**, "Analysis and interpretation of the Cramér-Rao lower-bound in astrometry: One dimensional case", *Publications of the Astronomical Society of the Pacific* (PASP), vol. 125: pp. 580-594, May, 2013.

CONFERENCE PROCEEDINGS AND ABSTRACTS

[C9] G. Ramos-Llorden, **R. A. Lobos,** T. H. Kim, Q. Tian, S. Tounetki, T. Witzel, B. Keil, A. Yendiki, B. Bilgic, J. P. Haldar, S. Huang, "Improved multi-shot EPI ghost correction for high gradient strength diffusion MRI using structured low-rank modeling k-space reconstruction", *International Society for Magnetic Resonance in Medicine 29th Annual Meeting*, 2021. (Abstract)

[C8] D. Kim, **R. A. Lobos**, J. Coll-Font, M. van den Boomen, J. Conklin, J. Pang, D. Staeb, P. Speier, X. Bi, B. Ghoshhajra, J. P. Haldar, C. T. Nguyen, "Feasibility of single breath-hold CINE with combined Simultaneous Multi-Slice (SMS) and Region-Optimized Virtual (ROVir) coils.", *International Society for Magnetic Resonance in Medicine 29th Annual Meeting*, 2021. (Abstract)

- **Recipient of a Magna Cum Laude ISMRM Merit Award.**

[C7] **R. A. Lobos,** T. H. Kim, K. Setsompop, J. P. Haldar, "Advanced New Linear Predictive Reconstruction Methods for Simultaneous Multislice Imaging.", *International Society for Magnetic Resonance in Medicine 28th Annual Meeting*, Sydney, 2020. (Abstract)

[C6] **R. A. Lobos**, R. M. Leahy, J. P. Haldar, "Autoregression and Structured Low-Rank Modeling of Sinograms.", *IEEE International Symposium on Biomedical Imaging*, Iowa City, 2020.

- **Best Paper Award Finalist (One of the best 11 papers out of 747 submissions).**

[C5] **R. A. Lobos**, R. M. Leahy, J. P. Haldar, "Low-Rank Modeling of Local Sinogram Neighborhoods with Tomographic Applications.", *Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, 2019.

[C4] **R. A. Lobos**, J. P. Haldar, "Improving the Performance of Accelerated Image Reconstruction in K-Space: The Importance of Kernel Shape.", *International Society for Magnetic Resonance in Medicine 27th Annual Meeting*, Montral, 2019. (Abstract)

[C3] **R. A. Lobos**, A. Javed, K. S. Nayak, W. S. Hoge, J. P. Haldar, " Robust Autocalibrated LORAKS for Improved EPI Ghost Correction with Structured Low-Rank Matrix Models.", *International Society for Magnetic Resonance in Medicine 26th Annual Meeting*, Paris, 2018, p. 3533. (Abstract)

[C2] **R. A. Lobos**, A. Javed, K. S. Nayak, W. S. Hoge, J. P. Haldar, "Robust Autocalibrated LORAKS for EPI Ghost Correction.", *IEEE International Symposium on Biomedical Imaging*, Washington, DC, 2018, p. 663-666.

[C1] **R. A. Lobos**, T. H. Kim, W. S. Hoge, J. P. Haldar, " Navigator-free EPI ghost correction using low-rank matrix modeling: Theoretical insights and practical improvements", *International Society for Magnetic Resonance in Medicine 25th Annual Meeting*, Honolulu, 2017, p. 449. (Abstract)

- **Recipient of a Summa Cum Laude ISMRM Merit Award (Featured with a Power Pitch presentation (hand-selected as one of the 220 most interesting abstracts out of 6,780 submissions to the conference).**

INVITED TALKS

[IT3] **Accelerated MRI Reconstruction Using LORAKS: Leveraging k-space Linear Predictability and Structured Low-rank Modeling to Predict Missing Samples**
- ISMRM Workshop on MRI Acquisition & Reconstruction, Virtual Event, September, 2021

[IT2] **Low-Rank Modeling of Local Sinogram Neighborhoods with Tomographic Applications**
- Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, , November, 2019

[IT1] **Achievability of the Cramér-Rao Lower Bound in Astrometry**
- Dynamical Astronomy in Latin-America (ADELA), Santiago, Chile, September, 2014

TALKS

[T2] **Autoregression and Structured Low-rank Modeling of Sinograms**
- IEEE ISBI, Iowa City, IA, April, 2020

[T1] **Robust Autocalibrated LORAKS for EPI Ghost Correction**
- IEEE ISBI, Washington, D.C., April, 2018

TEACHING EXPERIENCE

University of Southern California, Los Angeles, CA

Teaching Assistant

- EE588: Optimization for the Information and Data Sciences — Fall 2021
  - Instructor of weekly discussion sessions
  - Preparation of homework solutions
  - Holding office hours
- EE503: Probability for Electrical and Computer Engineers — Spring 2021
  - Instructor of weekly discussion sessions
  - Preparation of homework solutions
  - Holding office hours
- EE141: Applied Linear Algebra for Engineering — Fall 2020
  - Instructor of weekly discussion sessions

- Holding office hours
- EE483: Introduction to Digital Signal Processing — Spring 2020
  - Instructor of weekly discussion sessions
  - Holding office hours
- EE483: Introduction to Digital Signal Processing — Fall 2019
  - Preparation of homework solutions
  - Holding office hours

Universidad de Chile, Santiago, Chile

Teaching Assistant

- EL7024: Information Theory — Spring 2014
  - Guiding term projects, grading assignments, and holding office hours
- EL3005: Signals and Systems I — Fall 2013
  - Guiding term projects, grading assignments, and holding office hours
- EL4003: Signals and Systems II (Estimation and Detection Theory) — Spring 2013
  - Guiding term projects, grading assignments, and holding office hours

PROFESSIONAL SERVICES

Reviewer

Journals

- IEEE Transactions on Medical Imaging
- IEEE Transactions on Computational Imaging

Conferences

- IEEE International Symposium on Biomedical Imaging (ISBI)

MEMBERSHIPS

- ISMRM Trainee member
- IEEE Student member
- IEEE Signal Processing Society student member

SPECIALIZATIONS

- Coursera Deep Learning Specialization — Spring 2021