



**Alonso Ramírez-Manzanares**  
Department of Computer Science, Research Center in  
Mathematics (CIMAT), México.

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## Education

### 2008 **Post Doctorate in Radiology**

University of Pennsylvania (Penn Image Computing & Science Lab)  
Topic: Numerical models for brain microstructure estimation.

### 2007 **D. Sc. in Computer Science** (GPA 3.97/4)

Research Center in Mathematics (Centro de Investigación en Matemáticas)  
Dissertation: A Multimodal Regularisation Framework. Application to Axon Fiber  
Orientation Estimation and Transparent Optical Flow Estimation.

## Research Areas and Experience

**(27 FULL-LENGTH PEER-REVIEWED PUBLICATIONS: 1ST AUTHOR 14, 2ND AUTHOR 4.  
424 CITATIONS IN GOOGLE, 312 IN SCOPUS [NO SELF-CITATION], H INDEX 10, I10 INDEX 11 [UNTIL  
2018], SEE COMPLETE LIST OF PUBLICATIONS IN NEXT PAGES)**

- Image, signal processing and robot vision.
- Numerical methods and optimisation.
- Computational chemistry.
- Machine learning: pattern recognition, parametric methods, sparsity models.
- Applications: Segmentation, denoising, movement detection, medical image computing (brain, lung; MRI, dMRI), computer vision, molecular design.

## Honors

- 2015 Winner of the White Matter Modelling Challenge at ISBI
- 2015 Member of the Mexican National Research System (SNI)
- 2007 Best Paper Award at VLSM workshop at ICCV conference

## Employment

- Aug. 2014 - Present Centro de Investigación en Matemáticas (CIMAT) Mexico, Department of Computer Science, Full Researcher, Titular A.
- Aug. 2017 - Jul 2014 University of Guanajuato, Mexico, Department of Mathematics, Teacher/Researcher Titular A.

## Research Grants Funded

- Title: Estimation of brain water diffusion features from multiple axon fiber models
- Personnel: At University of Guanajuato: Ramírez-Manzanares Alonso.
- Budget: 6,000 USD, 2010.
- Source: Council of Science and Technology of the State of Guanajuato.
  
- Title: Computational methods for IP and optimisation on high dimensional data.
- Personnel: At University of Guanajuato: Ramírez-Manzanares Alonso.
- Budget: 50,000 USD, 2013-2016.
- Source: National Council of Science and Technology.

## Ph. D. Student Advising (+ 4 Master Student + 5 Bachelor Student Advising)

- 2014-2017 PhD co-advisor for a computer-science PhD student (Ricardo Coronado-Leija)  
Topic: Multi-resolution base methods for estimating white matter tissue properties; Co-advisor: Prof. José L. Marroquín.
- 2011-2016 PhD co-advisor for a computer-science PhD student (Aranda Ramón)  
Topic: A sparse adaptive dictionary method and flocking base method for brain tractography; Co-advisor: Prof. Mariano Rivera.
- 2007-2010 PhD co-advisor for a medical physics PhD student (Enedino Hernández-Torres)  
Topic: Diffusion Tensor Imaging in Spine and Brain; Co-advisors: Profs. Teodoro Córdova Fraga (DIFUG) and Alexander MacKay (UBC).

## Podium Presentations

- 2017 Meeting of the International Society in of Magnetic Resonance in Medicine, Honolulu, Hawai, USA.
- 2015 IEEE Int. Symposium on Biomedical Imaging (ISBI), White Matter Modeling Challenge, NY, USA.
- 2012 IEEE Int. Symposium on Biomedical Imaging (ISBI), HARDI reconstruction challenge, San Francisco, USA.
- 2009 Int. Conference on Medical Image Computing and Computer Assisted Intervention, Workshop Diffusion Modelling and FiberCup, London U.K.
- 2003 International Conference on Computer Vision (ICCV), Workshop on Variational and Level Set Methods, Nice, France.

## Professional Service (Selected)

Peer reviewing for international journals

Elsevier

NeuroImage (NIMG), Medical Image Analysis (MedIA), Biological Psychiatry (BP), Computerized Medical Imaging and Graphics (CMIG), Computers in Biology and Medicine (CBM)

IEEE Transactions on

Medical Imaging (TMI), Biomedical Engineering

Springer

Medical & Biological Engineering & Computing (MBEC), International Journal of Computer Vision (IJCV)

Wiley

Imaging Systems and Technology (IST)

Oxford Journals

The computer Journal (CJ)

Peer reviewing for international conferences

Scientific Review Committee member:

Workshop on computational diffusion MRI 2015 and 2016  
Pacific-Rim Symposium on Image and Video Technology, 2013

## PUBLICATIONS

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### Indexed Journals

(Include the SCImago Journal & Country Ranking (SJR) 2103, <http://www.scimagojr.com/>)

- Ricardo Coronado-Leija, Alonso Ramirez-Manzanares and Jose Luis Marroquin. Estimation of individual axon bundle properties by a Multi-Resolution Discrete-Search method, *Medical Image Analysis* , 42(1), pp. 26-43, Dec. 2017 (5-Year Impact Factor: 5.012).
- Uran Ferizi, Benoit Scherrer, Torben Schneider, Mohammad Alipoor, Odin Eufrazio, Rutger H.J. Fick, Rachid Deriche, Markus Nilsson, Ana K. Loya-Olivas, Mariano Rivera, Dirk H.J. Poot, Alonso Ramirez-Manzanares, Jose L. Marroquin, Ariel Rokem, Christian Pötter, Robert F. Dougherty, Ken Sakaie, Claudia Wheeler-Kingshott, Simon K. Warfield, Thomas Witzel, Lawrence L. Wald, José G. Raya, Daniel C. Alexander, Diffusion MRI microstructure models with in vivo human brain Connectome data: results from a multi-group comparison. *Nuclear Magnetic Resonance in Biomedicine*, 30(9), Sep. 2017.
- Ramon Aranda, A. Ramirez-Manzanares, Mariano Rivera, Sparse and Adaptive Diffusion Dictionary (SADD) for Recovering Intra-voxel White Matter Structure, *Medical Image Analysis*, 26(1), pp. 243–255, Dec. 2015, [dx.doi.org/10.1016/j.media.2015.10.002](http://dx.doi.org/10.1016/j.media.2015.10.002) (5-Year Impact Factor: 4.662).
- A. Ramirez-Manzanares J. Peña, J. M. Azpiroz, G. Merino. A hierarchical algorithm for molecular similarity (H-FORMS). *Journal of Computational Chemistry* , Volume 36(19), pp. 1456–1466. July 15, 2015. DOI: 10.1002/jcc.23947 (Impact Factor: 3.601)
- Daducci A, Canales-Rodriguez E, Descoteaux M, Gur Y, Mani M, Merlet S, Ramirez-Manzanares A, Rodrigues P, Reisert M, Sepelband F. et al. Quantitative comparison of reconstruction methods for intra-voxel fiber recovery from diffusion MRI. *IEEE Trans Med Imaging*, 33(2), February 2014, 384-99. (5-Year Impact Factor: 4.268, SNIP 2.779, SJR Rank 2(1), 2+3 scopus cites, 5+6 google-scholar-cites)
- Ramon Aranda, Mariano Rivera, Alonso Ramirez-Manzanares, A flocking based method for brain tractography, *Medical Image Analysis*, 18(3),2014, 515–530. (5-Year Impact Factor: 4.662, SNIP 2.931)
- J. M. Azpiroz, D. Moreno, A. Ramirez-Manzanares, J. M. Ugalde, M. A. Mendez-Rojas, G. Merino. Heavy periodane, *Journal of Molecular Modeling*. May 2013, Volume 19, Issue 5, pp 1953-1958. (5-Year Impact Factor: 2.301, SNIP 0.663, 1+0 Web of Sciences, 1+0 google-scholar-cites)

- Mariano Rivera, Oscar Dalmau Cedeño, Washington Mio, Alonso Ramirez-Manzanares: Spatial Sampling for Image Segmentation. *The computer Journal*, Volume 55, Issue 3, pp. 313-324, March 2012, DOI 10.1093/comjnl/bxr032 (5-Year Impact Factor: 0.954, SNIP 1.364, 1+0 Scopus, 2+1 google-scholar-cites)
- A. Ramirez-Manzanares, P. A. Cook, M. Hall, M. Ashtari and J. C. Gee. Resolving Axon Fiber Crossings at Clinical b-values: An Evaluation Study, *Journal of Medical Physics* Volume 38, Issue 9, 5239-53, Sep. 2011. (5-Year Impact Factor: 3.138, SNIP 1.679, 4+1 scopus-cites, 5+2 google-scholar-cites)
- A. Ramirez-Manzanares, M. Rivera, P. Kornprobst and F. Lauze. Variational multi-valued velocity field estimation for transparent sequences, *Journal of Mathematical Imaging and Vision*, Volume 40, Issue 3, 285-304, July 2011. (5-Year Impact Factor: 1.696, SNIP 2.138, SJR Rank 8(2), 1+0 scopus-cites, 2+0 google-scholar-cites)
- P. Fillard, M. Descoteaux, A. Goh, S. Gouttard, B. Jeurissen, J. Malcolm, A. Ramirez-Manzanares, M. Reisert, K. Sakaie, F. Tensaouti, T. Yo, J. F. Mangin, C. Poupon. Quantitative Evaluation of 10 Tractography Algorithms on a Realistic Diffusion MR Phantom, *Neuroimage*, Volume 56, Issue 1, 220-234, May 2011. (5-Year Impact Factor: 7.063, SNIP 1.858, SJR Rank 3(3), 80+12 scopus-cites, 129+17 google-scholar-cites)
- A. Ramírez-Manzanares, M. Rivera, B. C. Vemuri, P. Carney and T. Mareci. Diffusion Basis Functions Decomposition for Estimating White Matter Intra-voxel Fiber Geometry. *IEEE Transactions on Medical Imaging*. Aug, Vol. 26, No. 8, pp.1091-1102. 2007 (5-Year Impact Factor: 4.268, SNIP 2.779, SJR Rank 2 (4), 25+17 scopus-cites, 45+23 google-scholar-cites)
- A. Ramírez-Manzanares and M. Rivera. Basis Tensor Decomposition for Restoring Intra-Voxel Structure and Stochastic Walks for inferring Brain Connectivity DT-MRI. *International Journal of Computer Vision*, 69(1), pp. 77-92, 2006. (5-Year Impact Factor: 4.856, SNIP 5.428, SJR Rank 2 (5), 10+6 scopus-cites, 14+9 google-scholar-cites)

(1) SJR, Subject Category: Radiology, Biomedical Engineering

(2) SJR, Subject Category: Computer Vision and Pattern Recognition

(3) SJR, Subject Category: Radiology, Nuclear Medicine and Imaging

(4) SJR, Subject Category: Radiology, Biomedical Engineering

(5) SJR, Subject Category: Computer Vision and Pattern Recognition

## Other Journals

- A. Ramírez-Manzanares, J. Rafael-Patiño, M. Ashtari: Denoising of brain DW-MR data by single and multiple diffusion kernels. *Acta Universitaria*, 2010, Volume 20 (3), pp 44-50. ISSN 0188-6266.

## Conferences

(Include CORE2013 Conference Ranking, [www.core.edu.au/coreportal](http://www.core.edu.au/coreportal))

- Ricardo Coronado-Leija, Alonso Ramirez-Manzanares and Jose Luis Marroquin. Robust Estimation and In-vivo Validation of the Axon Bundle Diffusivity Profiles. Abstract 2074, 2017. In Annual Meeting of the International Society of Magnetic Resonance in Medicine. Hawaii, USA. Selected (with another 10 works) for oral presentation in the special session "Diffusion: Multi-Site & Validation".
- Luis Concha, Jorge Larriva-Sahd, Gilberto Rojas-Vite, Ramsés Noguez-Imm, Ricardo Coronado-Leija, Alonso Ramírez-Manzanares, and José Luis Marroquín. Diffusion MRI of axonal degeneration in areas of fiber crossing: Histological correspondence. Abstract 3814, 2017. In Annual Meeting of the International Society of Magnetic Resonance in Medicine. Hawaii, USA. Selected for oral and poster presentation.
- Jonathan Rafael-Patiño, Alonso Ramirez-Manzanares, Joaquín Peña and Hui Zhang. Validating Particle Dynamics in Monte Carlo Diffusion Simulation using the Finite Element Method. Abstract 1586, 2017. In Annual Meeting of the International Society of Magnetic Resonance in Medicine. Hawaii, USA.
- Mario Ocampo-Pineda, Alessandro Daducci and Alonso Ramirez-Manzanares. Estimation of a novel set of intra and extracellular diffusivity parameters from modern DW-MRI. Abstract 1720, 2017. In Annual Meeting of the International Society of Magnetic Resonance in Medicine. Hawaii, USA.
- A. Ramirez-Manzanares, Mario Ocampo-Pineda. Estudio de difusión en medios porosos con aplicación a la estimación de diámetros de conectores cerebrales. Presentado en el Congreso de la SMM 2016.
- A. Ramirez-Manzanares, J. L. Marroquin, P. A. Cook, J. C. Gee and M. Rivera. Empirical Diffusion-and-Direction Distributions (ED<sup>3</sup>) to Estimate White Matter Microstructure. International Symposium on Biomedical Imaging, White Matter Modeling Challenge 2015.
- Ricardo Coronado-Leija, Alonso Ramirez-Manzanares, Jose Luis Marroquin, and Rolando Jose Biscay. Accurate Multi-resolution Discrete Search Method to Estimate the Number and Directions of Axon Packs from DWMRI. Abstract 3726, 2015

Annual Meeting of the International Society of Magnetic Resonance in Medicine. Selected (with another 5 works) to oral presentation in special the session "Focused Discussion: Fusion with Diffusion".

- Ramon Aranda, Mariano Rivera y Alonso Ramirez-Manzanares. SPARSE AND ADAPTIVE DIFFUSION DICTIONARY FOR RECOVERING INTRA-VOXEL WHITE MATTER STRUCTURE. Abstract at the 2015 Annual Meeting of the International Society of Magnetic Resonance in Medicine. Selected to oral presentation in the special session "Diffusion MRI", A. Aranda is prized with \$100USD.
- J. Luis Cabellos, Filiberto Ortiz, Rafael Grande-Aztatzi, Alonso Ramirez-Manzanares and Gabriel Merino, "RANDOM MOLECULAR STRUCTURE SEARCHING", XII Reunión Mexicana de Físico Química Teórica Nov. 2013.
- Ramón Aranda, Mariano Rivera and Alonso Ramirez-Manzanares, Self-oriented diffusion basis functions for white matter structure estimation, in Proc Int. Sym. Biomedical Imaging (ISBI), pp 1138-1141, 2013. (19% acceptance ratio for oral)
- Alonso Ramirez-Manzanares, Ramon Aranda, Mariano Rivera and Omar Ocegueda. Diffusion Basis Functions on Spatially Regularized DW-MRI. In: Workshop on HARDI reconstruction. ISBI, Spain. May, 2012 (Our team, Frogs, got 3th, 3th and 4th ranking place on different contests, see [http://hardi.epfl.ch/static/events/2012\\_ISBI/\\_static/Talks/workshop.pdf](http://hardi.epfl.ch/static/events/2012_ISBI/_static/Talks/workshop.pdf))
- Ramón Aranda, Mariano Rivera, Alonso Ramírez-Manzanares. Paralelización de Partículas Masivas para la Estimación de Fibras Cerebrales. In: 3rd International Supercomputing Conference in México. March, 2012.
- J. Rafael-Patiño, A. Ramirez-Manzanares, M Rivera: Estimation of Anisotropic Water Diffusion Indexes on Axon Bundle Crossings, IEEE Proceedings on 10th Mexican International Conference on Artificial Intelligence (MICAI), pp. 196-201, Dec. 2011
- R. Aranda, M. Rivera, and A. Ramirez-Manzanares: Improved Diffusion Basis Functions Fitting and Metric Distance for Brain Axon Fiber Estimation. In Proc. Fifth Pacific-Rim Symposium on Image and Video Technology, pp.36-47, Nov. 2011. (Rank B, Source: CORE2013) \*
- C. C. Brun, H. Wang, R. Aranda, A. Ramirez-Manzanares, M. Rivera, P. A. Yushkevich, J. C. Gee: Involving machine learning and particule mass in the segmentation of cortico-spinal tract. DTI Tractography Challenge, MICCAI, September, 2011 (Rank A, Source: CORE2013).
- A. Ramirez-Manzanares, A. Palafox-Gonzalez, M. Rivera: Robust Spatial Regularization and Velocity Layer Separation for Optical Flow Computation on Transparent Sequences. Advances in Artificial Intelligence, Lecture Notes in Computer Science, Volume 6437/2010 : 325-336 DOI: 10.1007/978-3-642-16761-4\_29 , 2010

- Ramón Aranda, Mariano Rivera, Alonso Ramírez-Manzanares, Manzar Ashtari and James C. Gee, Massive Particles for Brain Tractography, *Advances in Artificial Intelligence, Lecture Notes in Computer Science*, 2010, Volume 6437/2010, 446-457, DOI: 10.1007/978-3-642-16761-4\_39 (0+1 scopus-cites, 0+1 google-scholar-cites)
- A. Ramírez-Manzanares, J. Rafael-Patiño, M. Ashtari, Single and Multi Diffusion-Tensor Based Kernels for Anisotropic Filtering of Brain DW-MR Images, *IEEE Electronics, Robotics and Automotive Mechanics Conference*, pp.399-404, 2010
- E. Hernandez, T. Cordova, A. Ramírez-Manzanares, D. K. B. Li, M. F. Dvorak, A. Curt, E. L. MacMillan, B. Mädler, A. L. Mackay. Pitfalls of Spinal DTI in Cervical Spondylotic Myelopathy. Annual Meeting ISMRM, 1-7, Stockholm, Sweden, May 2010, (rigorous peer selection, with a rejection rate ~30%)
- A. Ramirez-Manzanares, M. Rivera, and J. C. Gee. Denoising Intra-voxel Axon Fiber Orientations by Means of EC-QMMF Method. In 8th Mexican International Conference on Artificial Intelligence 11-Nov-2009, Guanajuato, LNCS. Pp. 303-311.
- A. Ramirez-Manzanares, M. Rivera, and J. C. Gee. Depicting axon fibers on a diffusion phantom by means of hybrid DBF-DT data. In Workshop Diffusion Modelling and Fiber Cup at MICCAI 2009. London, U.K. 24 Aug. 2009. pp. 1-4. (1+2 google-scholar-cites)
- E. Hernandez, Alex L. Mackay, Erin L. MacMillan, Burkard Mädler, David K. Li<sup>2</sup>, M F. Dvorak, Teodoro Cordova, A. Ramirez-Manzanares, C Laule, Diffusion Tensor Imaging of Subjects with Cervical Spondylitic Myelopathy: Use of the Eigenvalues as Indicators of Spinal Stenosis. Annual Meeting ISMRM, 18-24 Apr 2009, Honolulu, Hawaii, USA. (rigorous peer selection, with a rejection rate ~30%)
- G. Song, A. Ramírez-Manzanares and J. C. Gee. A simultaneous segmentation and regularization framework for vessel extraction in CT images. *First International Workshop on Pulmonary Image Processing*, 2008, pp 185-193.
- A. Ramirez-Manzanares, P. A. Cook, and J. C. Gee. A comparison of methods for recovering intra-voxel white matter fiber architecture from clinical diffusion imaging scans. In *Med Image Comput Comput Assist Interv (New York, USA, Sep 2008)*, vol. 5241 of *Lecture Notes in Computer Science*, Springer Berlin / Heidelberg, pp. 305-312. (Rank A, Source: CORE2013, ~31% Acceptance Ratio, 5+3 scopus-cites, 7+4 google-scholar-cites).
- A. Ramirez-Manzanares, H. Zhang, M. Rivera, and J. C. Gee. Robust regularization for the estimation of intra-voxel axon fiber orientations. In *Workshop Math Methods in Biomed Imag Anal (Anchorage, Alaska, Jun 2008)*, pp. 1-8. (dentro de CVPR, Rank A, Source: CORE2013, 32% Acceptance Rate, 0+4 google-scholar-cites)

- A. Ramírez-Manzanares, M. Rivera, P. Kornprobst and F. Lauze. A Variational Approach for Multi-Valued Velocity Field Estimation in Transparent Sequences. 1st International Conference on Scale Space and Variational Methods in Computer Vision, Ischia, Italy. LNCS. pp. 227-238. May. 2007. ( 1+2 scopus-cites, 42+2 google-scholar-cites)
- A. Ramírez-Manzanares and M. Rivera, Basis Pursuit based algorithm for intra-voxel recovering information in DW-MR, Procc. IEEE Sixth Mexican International Conference on Computer Science (ENC'05), pp. 152-157, Puebla, México, 2005. (0+2 scopus-cites, 0+2 google-scholar-cites)
- A. Ramírez-Manzanares, M. Rivera, B. C. Vemuri and T. Mareci. Basis Functions for Estimating Intra-voxel Structure in DW-MRI. Procc. IEEE Medical Imaging Conference 2004, Rome, Italy, pp. 4207- 4211, October 2004. ( 0+4 scopus-cites, 4+5 google-scholar-cites)
- A. Ramírez-Manzanares and M. Rivera. Brain Nerve Bundles Estimation by Restoring and Filtering Intra-Voxel Information in Diffusion Tensor MRI. VLSM 2003. Nice France, pp. 71-80. October 2003. (Prizewinner as Best Student Paper, 11+10 google-scholar-cites)

\* CORE2013 symbology: A -> excellent conference, B -> good conference

## Research Reports

- A. Ramírez-Manzanares, M. Rivera, P. Kornprobst and F. Lauze. Multi-Valued Motion Fields Estimation for Transparent Sequences with a Variational Approach. Rapport De Recherche Inria, Report number RR-5920. Jun. 2006.
- A. Ramirez-Manzanares, M. Rivera, P. Kornprobst and F. Lauze. Multi-Valued Motion Fields Estimation for Transparent Sequences with a Variational Approach. Reporte Técnico del CIMAT, number 22.06.2006, I-06-12 (CC). 2006.
- A. Ramirez-Manzanares, M. Rivera, B. C. Vemuri and T. Mareci. Basis functions for estimating intra-voxel structure in DW-MRI. Reporte Técnico del CIMAT, number 18.10.2004, I-04-10 (CC). 2004.



### Resume of Cites until 2015

<i>Tipo artículo</i>	<i># Scopus</i>	<i># A Type en Scopus</i>	<i># Google-Scholar</i>	<i># A Type Google-Scholar</i>
<i>Indexed Journals</i>	132	97	208	159
<i>Conference/workshops</i>	21	9	58	25
<b>TOTALES</b>	153	106	266	184

**Total "Type A" cites (by eliminating all self-citations) until January 2018:**

**Scopus: 312**

**Google Scholar: 424**