

Diego Seco Naveiras

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CITIZENSHIP	Spain	
RESEARCH INTERESTS	Design and analysis of algorithms and data structures, space-efficient data structures, Spatio-temporal databases, Geographic Information Systems, Geographic Information Retrieval, Bioinformatics.	
EDUCATION	University of A Coruña , A Coruña, Spain (2006-2009) Ph.D. in Computer Science <ul style="list-style-type: none">• Thesis: <i>Técnicas de indexación y recuperación de documentos utilizando referencias geográficas y textuales.</i>• Advisors: Miguel R. Luaces and José R. Ríos Viqueira (2000-2006) Computer Engineering <ul style="list-style-type: none">• Thesis: <i>Componente Java para el análisis de redes en Sistemas de Información Geográfica.</i>• Advisor: Miguel R. Luaces	
SCHOLARSHIPS	<ul style="list-style-type: none">• (2010 – 2012) Postdoctoral scholarship given by Xunta de Galicia (Ángeles Alvariño).• (2009) Predoctoral scholarship given by Xunta de Galicia (María Barbeito).• (2006 – 2008) Predoctoral scholarship given by Xunta de Galicia.	
RESEARCH STAYS	<ul style="list-style-type: none">• (07/2014 – 1 week) Invited researcher, University of Helsinki. Areas: space-efficient data structures for GIS and bioinformatics. Inviting professor: Travis Gagie.• (10/2012 – 1 month) Postdoctoral stay, Aristotle University of Thessaloniki. Areas: spatio-temporal data in MapReduce. Inviting professor: Apostolos Papadopoulos.• (09/2010 – 04/2012) Postdoctoral stay, University of Waterloo. Areas: algorithms and data structures. Inviting professor: Alejandro López Ortiz.• (10/2009 – 06/2010) Postdoctoral stay, University of Chile. Areas: compact data structures in Geographic Information Systems and Geographic Information Retrieval. Inviting professor: Gonzalo Navarro.• (06/2009 – 09/2009) Predoctoral stay, University of Chile. Areas: compact data structures in Geographic Information Systems. Inviting professor: Gonzalo Navarro.	
ACADEMIC EXPERIENCE	<ul style="list-style-type: none">• (2016-) University of Concepción, Associate professor, Computer Science Department.• (2013-2015) University of Concepción, Assistant professor, Computer Science Department.• (2011-2012) University of A Coruña, Teaching assistant, Computer Science Department (Master on Computer Science, 10 hours).• (2008-2013) University of A Coruña, Teaching assistant, Computer Science Department (Computer Engineering, 370 hours).• (2008-2009) Aula de Formación Informática, Bases de Datos: PostgreSQL (20 hours).	

- ADMINISTRATIVE POSITIONS
- (2018-2020) **University of Concepción**, Chair, Department of Computer Science.
 - (2016-2018) **University of Concepción**, Chair, Master and PhD Programs, Computer Science.
 - (2016-2018) **University of Concepción**, Vice chair, Department of Computer Science.
- PROFESSIONAL EXPERIENCE
- **University of A Coruña**, A Coruña, Spain. *Research Assistant* **October 2008 to December 2008**
 - **Enxenio**, A Coruña, Spain. *Senior Programmer* **March 2006 to October 2006**
- GRANTS AND RESEARCH CONTRACTS
- CYTED 519RT0579, Coordinator, Asistentes Inteligentes para las Infraestructuras de Datos Espaciales. Funded by CYTED, Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo (2019-2022).
 - IMFDF, Co-investigator, Millennium Institute for Foundational Research on Data. Funded by Ministry of Economy, Development and Tourism, Chile (2018-2028).
 - Fondecyt 1170497, Co-investigator, Multi-granular modeling and processing of massive moving-object data. Funded by CONICYT Fondecyt Regular, Chile (2017-2019).
 - TIN2016-77158-C4-3-R, Co-investigator, Velocity: Procesado eficiente de Big Data espacio-temporal para FlatCity. Funded by Ministerio de Economía y Competitividad, Spain (2016-2019).
 - RISE-690941, Co-investigator (coordinator UdeC group), Bioinformatics and Information Retrieval Data Structures Analysis and Design (BIRDS). Funded by European Commission, Horizon 2020 - Marie Skłodowska-Curie Research and Innovation Staff Exchange (2016-2019).
 - TIN2013-46801-C4-3-R, Co-investigator, Hermes-Space&Time-Healthy and efficient routes in massive open-data based smart cities: spatio-temporal modelling and querying. Funded by Ministerio de Economía y Competitividad, Spain (2014-2016).
 - Fondef IT13I20002, Co-investigator, AQUASAT: An integrated service for site-specific management of irrigation water. Funded by CONICYT Fondef IDeA, Chile (2014-2016).
 - Fondecyt 11130377, PI, GEOSOCIAL: High Performance Processing of Microblogs with Geographic and Temporal Information. Funded by CONICYT Fondecyt Iniciación, Chile (2013-2015).
 - TIN2009-14560-C03-02, Co-investigator, High Performance processing for large data sets represented as Graphs (HIPERGRAPH). Funded by Ministerio de Ciencia e Innovación, Spain (2010-2013).
 - GRC 2010/17, Co-investigator, Competitive Reference Group. Funded by Xunta de Galicia, Spain (2010-2012).
 - 10SIN028E, Co-investigator, Sistema de recepción e xestión de envío de pedidos e cálculo de rutas para Novolar. Funded by Xunta de Galicia, Spain (2010-2012).
 - 08SIN009CT, Co-investigator, XEOEDUCA: Herramienta para el desarrollo de aplicaciones para el autoaprendizaje de la geografa. Xunta de Galicia, Spain (2008-2010).
 - PGIDIT05SIN10502PR, Co-investigator, Herramientas y plataforma GIS Open Source. Xunta de Galicia, Spain (2005-2008).

- Silva-Coira, F.; Paramá, J.R.; de Bernardo, G.; Seco, D. Space-efficient representations of raster time series. *Information Sciences*, 566: 300-325, 2021.
- Arroyuelo, D.; Fuentes-Sepúlveda, J.; Seco, D. Three success stories about compact data structures. *Communications of the ACM*, 63(11): 64–65, 2020.
- Sanjuan-Contreras, C.E.; Gutiérrez, G.; Martínez-Prieto, M.A.; Seco, D. cBiK: A Space-Efficient Data Structure for Spatial Keyword Queries. *IEEE Access*, 8(1): 98827–98846, 2020.
- Fariña, A.; Martínez Prieto, M.A.; Claude, F.; Navarro, G.; Juan Lastra-Díaz; Nicola Prezza; Seco, D. On the Reproducibility of Experiments of Indexing Repetitive Document Collections. *Information Systems*, 83: 181–194, 2019.
- Li, Z.; Seco, D.; Sánchez, A. Microservice-Oriented Platform for Internet of Big Data Analytics: A Proof of Concept. *Sensors*, Special Issue Middleware Solutions for Wireless Internet of Things, 19(5): 1134, 2019.
- Mirabal, P.; Abreu, J.; Seco, D. Assessing the best edit in perturbation-based iterative refinement algorithms to compute the median string. *Pattern Recognition Letters*, 120: pp. 104–111, 2019.
- Inostroza, D.; Hernández, C.; Seco, D.; Navarro, G.; Olivera-Nappa, A. Cell Cycle and Protein Complex Dynamics in Discovering Signaling Pathways. *Journal of Bioinformatics and Computational Biology*, 17(3): 1950011, 2019.
- Fuentes-Sepúlveda, J.; Elejalde, E.; Ferres, L.; Seco, D. Parallel Construction of Wavelet Trees on Multicore Architectures. *Knowledge and Information Systems*, 51(3): pp. 1043–1063, 2017.
- Brisaboa, N. R.; de Bernardo, G.; Konow, Roberto; Navarro, G.; Seco, D. Aggregated 2D Range Queries on Clustered Points. *Information Systems*, 60: pp. 34–49, 2016.
- Rojas, G.; Seco, D.; Serrano, F. Boosting Point-of-Interest Recommendation with Multi-granular Time Representations. *Journal of Universal Computer Science*, 22(8): pp. 1148–1174, 2016.
- Places, A. S.; Fariña, A.; Luaces, M. R.; Pedreira, O.; Seco, D. A workflow management system to feed digital libraries: proposal and case study. *Multimedia Tools and Applications*, 75(7): pp. 3843–3877, 2016.
- Dorriviv, R.; Fraser, R.; He, M.; Kamali, S.; Kawamura, A.; Lpez-Ortiz, A.; Seco, D. On Minimum- and Maximum-Weight Minimum Spanning Trees with Neighborhoods. *Theory of Computing Systems*, 56(1): pp. 220–250, 2015.
- Brisaboa, N. R.; Rodriguez, M. Andrea; Seco, D.; Troncoso, R. A. Rank-based Strategies for Cleaning Inconsistent Spatial Databases. *International Journal of Geographical Information Science*, 29(2): pp. 280–304, 2015.
- Brisaboa, N. R.; Luaces, M. R.; Rodriguez, M. Andrea; Seco, D. An Inconsistency Measure of Spatial Data Sets with respect to Topological Constraints. *International Journal of Geographical Information Science*, 28(1): pp. 56–82, 2014.
- Claude, F.; Nicholson, P. K.; Seco, D. On the compression of search trees. *Information Processing and Management*, 50(2): pp. 272–283, 2014.
- Brisaboa, N. R., Luaces, M. R., Navarro, G., Seco, D. Space-Efficient Representations of Rectangle Datasets Supporting Orthogonal Range Querying. *Information Systems*, 38(5): pp. 635–655, 2013.

Brisaboa, N. R., Luaces, M. R., Places, A. S., Seco, D. Exploiting Geographic References of Documents in a Geographical Information Retrieval System Using an Ontology-based Index. *GeoInformatica*, 14(3): pp. 307–331, 2010.

BOOK CHAPTERS
AND OTHER
PUBLICATIONS

Brisaboa, N. R., Luaces, M. R., Seco, D. New Discovery Methodologies in GIS: Improving the Information Retrieval Process. *Discovery of Geospatial Resources: Methodologies, Technologies and, Emergent Applications*, IGI Global, United States, pp. 37–55, 2012.

Lorenzo, M., Cotelo, J. A. , Luaces, M. R., Seco, D. Collecting, Analyzing, and Publishing Massive Data about the Hypertrophic Cardiomyopathy. *Communications in Computer and Information Science - Biomedical Engineering Systems and Technologies*, Springer-Verlag, Germany, pp. 301–313, 2010.

Luaces, M. R., Pedreira, O., Places, A. S., Seco, D. A Web-Based Version of a Trivial Game to Promote Galician Culture. *Web Information Systems and Technologies*: pp. 242–252. LNBIP 18, 2009.

Luaces, M. R., Pedreira, O., Places, A. S., Seco, D. Los sistemas de Informacin geográfica en turismo. *ROTUR Revista de Ocio y Turismo*, 1: pp. 117–134, 2008. In Spanish.

Places, A. S., Brisaboa, N. R., Paramá, J. R., Pedreira, O., Seco, D. Managing the workflow of massive feeding of digital libraries. *Research in Computer Science*, 32: pp. 352–362.

- Fuentes-Sepúlveda, J.; Gatica, D.; Navarro, G.; Rodríguez, M. A.; Seco, D. Compact Representation of Spatial Hierarchies and Topological Relationships. *Proc. DCC'21*, pp. 113–122.
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- Cabrera-Crot, L.; Caniupán, M.; Rodríguez, M.A.; Seco, D. Trajectory Patterns Based on Segment-Cutting Clustering. *AMW'19*.
- Rivera, R.; Rodríguez, M. A.; Seco, D. Two-Level Index for Network-based Trajectories. *Proc. SPIRE'18*, pp. 348 – 362.
- Brisaboa, N. R.; de Bernardo, Guillermo; Navarro, G.; Varela Rodeiro, T.; Seco, D. Compact Representations of Event Sequences. *Proc. DCC'18*, pp. 237–246.
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- Fuentes-Sepúlveda, J.; Elejalde, E.; Ferres, L.; Seco, D. Efficient Wavelet Tree Construction and Querying for Multicore Architectures. *Proc. SEA'14*, pp. 150–161. LNCS 8504.
- Kamali, S., Ladra, S., López-Ortiz, A., Seco, D. Context-Based Algorithms for the List-Update Problem under Alternative Cost Models. *Proc. DCC'13*, pp. 361–370.
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- Dorigiv, R., Fraser, R., He, M., Kamali, S., Kawamura, A., López-Ortiz, A., Seco, D. On Minimum- and Maximum-Weight Minimum Spanning Trees with Neighborhoods. *Proc. WAOA'12*, pp. 93–106. LNCS 7846.
- Claude, F., Nicholson, P. K., Seco, D. Differentially Encoded Search Trees. *Proc. DCC'12*, pp. 357–366.
- Claude, F., Nicholson, P. K., Seco, D. Space Efficient Wavelet Tree Construction. *Proc. SPIRE'11*, pp. 185–196. LNCS 7024.
- Brisaboa, N. R., Luaces, M. R., Navarro, G., Seco, D. Range Queries over a Compact Representation of Minimum Bounding Rectangles. *Proc. SeCoGIS'10*, pp. 33–42. LNCS 6413.
- Brisaboa, N. R., Luaces, M. R., Navarro, G., Seco, D. A Fun Application of Compact Data Structures to Indexing Geographic Data. *Proc. FUN'10*, pp. 77–88. LNCS 6099.
- Brisaboa, N. R., Luaces, M. R., Pedreira, O., Places, A. S., Seco, D. Indexing Dense Nested Metric Spaces for Efficient Similarity Search. *Proc. PSI'09*, pp. 98–109. LNCS 5947.

- Brisaboa, N. R., Cerdeira-Pena, A., Luaces, M. R., Seco, D. Defining a Workflow process for textual and geographic indexing of documents. *Proc. ICEIS'09*, pp. 78–83.
- Brisaboa, N. R., Luaces, M. R., Navarro, G., Seco, D. A New Point Access Method Based on Wavelet Trees. *Proc. SeCoGIS'09, ER Workshop*, pp. 297–306. LNCS 5833.
- De Bernardo R., Guillermo, Cerdeira-Pena, A., Pedreira, O., Places, A. S., Seco, D. SCRABBLE.GZ: A Web-Based Collaborative Game to Promote the Galician Language. *Proc. of ACHI'09*, pp. 142–147.
- Montserrat, L., Cotelo, J. A. , Luaces, M. R., Seco, D. A Document Management System and Workflow to help at the Diagnosis of Hypertrophic Cardiomyopathy. *Proc. of HEALTHINF'09*, pp. 3–10.
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- Ladra, S, Luaces, M. R., Pedreira, O., Seco, D. A Toponym Resolution Service following the OGC WPS Standard. *Proc. W2GIS'08*, pp. 75–85. LNCS 5373.
- Luaces, M. R., Places, A. S., Rodríguez, F. J., Seco, D. Retrieving Documents with Geographic References Using a Spatial Index Structure based on Ontologies. *Proc. SeCoGIS'08, ER Workshops*, pp. 395–404. LNCS 5232.
- Brisaboa, N. R., Pedreira, O., Uribe, R., Solar, R., Seco, D. Clustering based similarity search in metric spaces with sparse spatial centers. *Proc. SOFSEM'08*, pp. 186–197. LNCS 4910.
- Luaces, M. R., Pedreira, O., Places, A. S., Seco, D. Trivial.gz: A Web-based Collaborative Game To Promote Galician Culture. *Proc. WEBIST'08*, pp. 67–73.
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- Luaces, M. R., Paramá, J. R., Pedreira, O., Seco, D., Viqueira, J. R. An Index Structure to Retrieve Documents with Geographic Information. *Proc. MDMM'07, DEXA Workshop*, pp. 64–68.
- Fariña, A.; Martínez Prieto, M.A.; Claude, F.; Navarro, G.; Juan Lastra-Díaz; Nicola Prezza; Seco, D. On the Reproducibility of Experiments of Indexing Repetitive Document Collections. *Proc. CIRCLE*, 2020.
- Carpenente M. L., Cerdeira-Pena, A., De Bernardo, G., Seco, D. An Integrated System for School Timetabling. *Proc. ICAART'11*, pp. 599–603.

POSTERS AND
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- Mirabal, P.; Abreu, J. I.; Seco, D.; Pedreira, O.; Chávez, E. Covering a set of points with k bounding boxes. *Proc. SCCC'20*, pp. 1–7.
- Sepúlveda, C.; Rodríguez, M. Andrea; Seco, D. Covering a set of points with k bounding boxes. *Proc. SCCC'19*, pp. 1–6.
- Varela-Rodeiro, T.; Brisaboa, N. R.; Navarro, G.; Seco, D.; de Bernardo, G. Compact Representations of Event Sequences. *Proc. JISBD'19*.
- Places, A. S.; Fariña, A.; Luaces, M. R.; Pedreira, O.; Seco, D. A workflow management system to feed digital libraries: proposal and case study. *Proc. JISBD'17*.
- Brisaboa, N. R.; Casares, R.; Rodríguez, M. Andrea; Romero, M.; Seco, D. Un índice espacio-temporal compacto para consultas time-slice y time-interval. *Proc. JISBD'15*.
- Brisaboa, N. R., Luaces, M. R., Navarro, G., Seco, D. Indexación mediante Arrays de Sufijos para Recuperación de Información Geográfica. *Proc. CERI'12*, pp. 73–84.
- Brisaboa, N. R., Luaces, M. R., Seco, D. Recuperación de Información Geográfica basada en una Descripción Semántica del Espacio. *Proc. CERI'10*, pp. 113–124.
- Brisaboa, N. R., Luaces, M. R., Navarro, G., Seco, D. Indexación espacial de puntos empleando wavelet trees. *Proc. JISBD'09*, pp. 225–236.
- Luaces, M. R., Paramá, J. R., Pedreira, O., Seco, D. LBD LOCAL: Un sistema para la recuperación de documentos con referencias geográficas. *Proc. SIG Libre'08*.
- Cerdeira-Pena, A., Luaces, M. R., Pedreira, O., Seco, D. Un Sistema de Gestión Documental y Workflow con Indexación Temática y Geográfica de los Documentos. *Proc. JIDEE'08*.
- Cerdeira-Pena, A., Luaces, M. R., Pedreira, O., Seco, D. Un Servicio de Resolución de Topónimos siguiendo el estándar OGC WPS. *Proc. JIDEE'08*.
- Lamas, J.I., Luaces, M. R., Places, A. S., R. López, Eduardo, Seco, D. Los GIS y servicios IDE en la difusión de la cultura gallega. La Web Cultura Galega. *Proc. JIDEE'08*.
- Luaces, M. R., Paramá, J. R., Seco, D. Servicio web de análisis de redes en sistemas de información geográfica. *Proc. JIDEE'07*.
- Luaces, M. R., Paramá, J. R., Pedreira, O., Seco, D., Viqueira, J. R. Una estructura de indexación para la recuperación de documentos con referencias geográficas. *Proc. EIDBD'07*, 1(7), pp. 19–26.
- Uribe, R., Solar, R., Brisaboa, N. R., Pedreira, O., Seco, D. SSSTree: búsqueda por similitud basada en clustering con centros espacialmente dispersos. *Proc. ENC'07*, pp. 1–13.
- Brisaboa, N. R., Places, A. S., Luaces, M. R., Seco, D. Desarrollo de Webs interactivas con filosofía AJAX: El TRIVIAL.GZ. *Proc. CACIC'06*.