Ivan Sipiran

Personal

- **Name:** Ivan Anselmo Sipiran Mendoza
- **Address:** Av. Beauchef 851, North Building, Third Floor. Santiago, Chile.
- **Email:** isipiran@dcc.uchile.cl

Experience

August 2020 - Current: **Assistant Professor**, *Department of Computer Science, University of Chile*, Santiago - Chile.

July 2015-July 2020: **Assistant Professor**, *Department of Engineering - Pontifical Catholic University of Peru*, Lima - Peru.

Dic. 2013 - Jun. 2015: **Post-doctoral researcher**, *Department of Computing and Information Sciences - University of Konstanz*, Konstanz - Germany.

Education

2014: **Ph.D.**, *Department of Computer Science - University of Chile*, Santiago-Chile.

2005: **Diploma in Engineering**, *National University of Trujillo*, Trujillo-Peru.

2000–2004: **Bachelor in Computer Science**, *National University of Trujillo*, Trujillo-Peru.

Research Projects

- Main researcher in the Project 02-2018-FONDECYT–BM-IADT-AV: *Restoration and conservation of archaeological objects using deep learning on graphs.*(January. 2019 - December 2020). Concytec, Peru.(Grant: US. 141,441.04 dollars).
- Main researcher in the STIC-AMSUD Project 234-2018-FONDECYT: *Optimized deep learning based repreentations for computer vision problems* (January. 2019 - January 2021).(Grant: US. 9,109.70 dollars).
- Main researcher in the Project Fincyt-PUCP 280-PNICP-BRI-2015: *Analysis of Symmetry in 3D Objects and its Applications in Archaeology* (July. 2015 - June 2017). InnovatePeru - Peru.(Grant: US. 98,286.53 dollars).
- Researcher in the EU-FP7 Project: *PRESIOUS* (Dic. 2013 - June 2015).
- Adjunct researcher in the Project Fondecyt (Chile) 1110111: *Interest Points Detection Algorithms for 3D Shape Matching* (2011-2013).

Grants / Awards

- Best Paper Award (Impact on Society) - Fraunhofer IGD (2018)
- Best Paper Award - Big Data Visual Analytics (2015).
- Outstanding postgraduate student. Department of Computer Science, University of Chile. 2013.

- Outstanding postgraduate student. Department of Computer Science, University of Chile. 2012.
- Best Doctoral Symposium Paper Award - ACM Multimedia (2011)
- Google Travel Award in ACM Multimedia Conference (2011)
- Conicyt Chile doctoral scholarship (2010-2013)
- NIC Chile doctoral scholarship (2009)
- Research Stay Support received from the Postgraduate Department - University of Chile. 2012.

Research Stays

- Department of Computer Science, University of Temuco, December 2017, Contact: Prof. Dr. Billy Peralta.
- Department of Computer Science, University of Chile, March 2016. Santiago, Chile. Contact: Prof. Dr. Benjamín Bustos.
- Research stay at the Visual Analytics Group, University of Konstanz, March 24th - May 6th 2012. Konstanz, Germany. Contact: Prof. Dr. Tobias Schreck.

Research Interests

- Shape Analysis
- 3D Computer Vision
- Geometry Processing

Teaching Experience

Spring 2020 - DCC, UChile

- Multimedia Databases

Fall 2020 - PUCP

- Computer Graphics (master)
- Deep Learning (undegraduate) - In english.
- Algorithms(undergraduate)

Spring 2019 - PUCP

- Advanced Techniques in Data Mining and Intelligent Systems (master)
- Computer Graphics (undegraduate) - In english.
- Algorithms (undegraduate)

Fall 2019 - PUCP

- Computer Graphics (master)

Spring 2018 - PUCP

- Computer Graphics (undegraduate)
- Algorithms (undegraduate)

Fall 2018 - PUCP

- Computer Graphics (master)
- Algorithms (undegraduate)

Spring 2017 - PUCP

- Computer Graphics (undegraduate)
- Algorithms (undegraduate)

Fall 2017 - PUCP

- Computer Graphics (master)
- Algorithms (undegraduate)

Spring 2016 - PUCP

- Computer Graphics (undegraduate)
- Algorithms (undegraduate)

Fall 2016 - PUCP

- Computer Graphics (master)
- Algorithms (undegraduate)

Fall 2013 - DCC - University of Chile

- Adjoint - Design and Analysis of Algorithms

Spring 2012 - DCC - University of Chile

- Adjoint - Algorithms and Data Structures

Spring 2011 - DCC - University of Chile

- Adjoint - Algorithms and Data Structures

Fall 2011 - DCC - University of Chile

- Adjoint - Algorithms and Data Structures

Fall 2010 - DCC - University of Chile

- Adjoint - Algorithms and Data Structures
- Adjoint - Databases

Spring 2008 - National University of Trujillo

- Computer Graphics (undergraduate)
- Computational Geometry (undergraduate)
- Data Structures (undergraduate)

Fall 2008 - National University of Trujillo

- Advanced Topics in Computer Science (undergraduate)
- Logic Programming (undergraduate)

Spring 2007 - National University of Trujillo

- Computer Graphics (undergraduate)
- Data Structures (undergraduate)

Fall 2007 - National University of Trujillo

- Advanced Topics in Computer Science (undergraduate)
- Logic Programming (undergraduate)

Spring 2006 - National University of Trujillo

- Advanced Topics in Databases (undergraduate)
- Data Structures (undergraduate)

Publications

Book Chapters

- Bustos, B., and Sipiran, I.: 3D shape matching for retrieval and recognition. In: 3D Imaging, Analysis, and Applications. Second Edition. Springer. 2020.
- Sipiran, I., Mavridis, P. and Schreck, T.: Geometric Matching. In The Encyclopedia of Archaeological Sciences, S.L. López Varela (Ed.). John Wiley and Sons. 2018.
- Bustos, B., and Sipiran, I.: 3D shape matching for retrieval and recognition. In: 3D Imaging, Analysis, and Applications. Springer. 2012.

Journals

- Moscoso,E., Biasotti, S., Giachetti, A., Tortorici, C., Werghi, N., Shaker, A., Berretti, B., Nguyen-Dinh, H., Le, M., Nguyen, H., Tran, M., Gigli, L., Velasco-Forero, S., Marcotegui, B., Sipiran, I., Bustos, B., Romanelis, I., Fotis, V., Arvanitis, G., Moustakas, K., Otu, E., Zwiggelaar, R., Hunter, D., Liu, Y., Arteaga, Y., Luxman, R.: SHREC'20 Track: Retrieval of digital surfaces with similar geometric reliefs. Computer & Graphics 91, October 2020, pages 199-218. 2020.
- Sipiran, I., Lokoc, J., Bustos, B., Skopal, T.: Scalable 3D shape retrieval using local features and the signature quadratic form distance. The Visual Computer Journal, 33(12), pp 1571–1585. Springer. 2017.
- Papaioannou, G., Schreck, T., Andreadis, A., Mavridis, P., Gregor, R., Sipiran, I., Vardis, K.: From reassembly to object completion - A complete systems pipeline. ACM Journal of Computing and Cultural Heritage, 10(2). 2017.
- Shao, L., Schleicher, T., Behrisch, M., Schreck, T., Sipiran, I., Keim, D.: Guiding the exploration of scatter plot data using motif-based interest measures. Journal of Visual Languages and Computing. Vol 36:1-12. Elsevier. 2016.
- Mavridis, P., Sipiran, I., Andreadis, A., Papaioannou, G.: Object completion using k-Sparse optimization. Computer Graphics Forum. 34(7):13-21. 2015.
- Sipiran, I., Gregor, R., Schreck, T.: Approximate symmetry detection in partial 3D meshes. Computer Graphics Forum. 33(7):131-140. 2014.

- Sipiran, I., Meruane, R., Bustos, B., Schreck, T., Li, B., Lu, Y., Johan, H.: A benchmark of simulated range images for partial shape retrieval. The Visual Computer Journal. 30(11):1293-1308. Springer. 2014.
- Sipiran, I. and Bustos, B.: Key-components: Detection of salient regions on 3D meshes. The Visual Computer Journal. 29(12):1319-1332. Springer. 2013.
- Sipiran, I. and Bustos, B., Schreck, T.: Data-aware 3D partitioning for generic shape retrieval. Computer & Graphics 37(5):460-472. Elsevier. 2013.
- Lian, Z., Godil, A., Bustos, B., Daoudi, M., Hermans, J., Kawamura, S., Kurita, Y., Lavoué, G., Van Nguyen, H., Ohbuchi, R., Ohkita, Y., Ohishi, Y., Porikli, F., Reuter, M., Sipiran, I., Smeets, D., Suetens, P., Tabia, H., Vandermeulen, D.: A comparison of methods for non-rigid 3D shape retrieval. Pattern Recognition. 1(46):449-461. Elsevier. 2013.
- Sipiran, I., and Bustos, B.: Harris 3D: A robust extension of the Harris operator for interest points detection on 3D meshes. The Visual Computer Journal. 27(11): 963-976. 2011

Conference Proceedings

- Sipiran, I.: Completion of Cultural Heritage Objects with Rotational Symmetry. In Proc. Eurographics Workshop on 3D Object Retrieval (3DOR). 2018.
- Hermoza, R., Sipiran, I.: 3D Reconstruction of Incomplete Archaeological Objects Using a Generative Adversarial Network. In Proc. Computer Graphics International (CGI). 2018.
- Sipiran, I.: Analysis of Partial Axial Symmetry on 3D Surfaces and its Application in the Restoration of Cultural Heritage Objects. ICCV Workshop on E-Heritage. International Conference on Computer Vision, pp. 2925-2933. 2017.
- F. A. Limberger, R. C. Wilson, M. Aono, N. Audebert, A. Boulch, B. Bustos, A. Giachetti, A. Godil, B. Le Saux, B. Li, Y. Lu, H. -D. Nguyen, V.-T. Nguyen, V.-K. Pham, I. Sipiran, A. Tatsuma, M.-T. Tram, S. Velasco-Forero: SHREC'17 Track: Point-Cloud Shape Retrieval of Non-Rigid Toys. Eurographics Workshop on 3D Object Retrieval (3DOR). 2017.
- S. Biasotti, E. Moscoso Thompson, M. Aono, A. Ben Hamza, B. Bustos, S. Dong, B.Du, A. Fehri, H. Li, F. A. Limberger, M. Masuomi, M. Rezaei, I. Sipiran, L. Sun, A. Tatsuma, S. Velasco Forero, R. C. Wilson, Y. Wu, J. Zhang, T. Zhao, F. Fornasa, A. Giachetti: SHREC'17 Track: Retrieval of Surfaces with Similar Relief Patterns. Eurographics Workshop on 3D Object Retrieval (3DOR). 2017.
- Shao, L., Schleicher, T., Behrisch, M., Schreck, T., Sipiran, I., Keim, D.: Guiding the exploration of scatter plot data using motif-based interest measures. Proc. IEEE International Symposium on Big Data Visual Analytics, pp 1-8. 2015.
- Andreadis, A., Gregor, R., Sipiran, I., Mavridis, P., Papaioannou, G., Schreck, T.: Fractured 3D object restoration and completion. Poster at SIGGRAPH. Article N. 74. 2015.
- Gregor, R., Lamprecht, A., Sipiran, I., Schreck, T., Bustos, B.: Empirical evaluation of dissimilarity measures for 3D object retrieval with application to multi-feature retrieval. Proc. 13th Int. Workshop on Content-based Multimedia Indexing. CBMI, pp 1-6. 2015.
- Godil, A., Dutagaci, H., Bustos, B., Choi, S., Dong, S., Furuya, T., Li, H., Link, N., Moriyama, A., Meruane, R., Ohbuchi, R., Paulus, D., Schreck, T., Seib, V., Sipiran, I., Yin, H., Zhang, C.: Range scans based 3D shape retrieval. Eurographics Workshop on 3D Object Retrieval, pp 153-160. 2015.

- Sipiran, I., Bustos, B., Schreck, T., Bronstein, A., Bronstein, M., Castellani, U., Choi, S., Lai, L., Li, H., Litman, R., Sun, L.: Scalability of non-rigid 3D shape retrieval. Eurographics Workshop on 3D Object Retrieval, pp 121-128. 2015.
- Gregor, R., Bauer, D., Sipiran, I., Perakis, P., Schreck, T.: Automatic 3D object fracturing for evaluation of partial retrieval and object restoration tasks - Benchmark and Application to 3D cultural heritage data. Eurographics Workshop on 3D Object Retrieval, pp 7-14. 2015.
- Gregor, R., Sipiran, I., Papaioannou, G., Schreck, T., Andreadis, A., Mavridis, P.: Towards automated 3D reconstruction of cultural heritage objects. Proc. Eurographics Workshop on Graphics and Cultural Heritage, pp 135-144. 2014.
- Sipiran, Ivan, and Bustos, Benjamin:A fully hierarchical approach for finding correspondences in non-rigid shapes. Proc. 14th IEEE International Conference on Computer Vision (ICCV'2013), IEEE Computer Society, pp 817-824. 2013.
- Sipiran, I., Meruane, R., Bustos, B., Schreck, T., Li, B., Lu, Y., Johan, H.: SHREC'13 Track: Large-Scale Partial Shape Retrieval Using Simulated Range Images. Proc. Eurographics Workshop on 3D Object Retrieval (3DOR'13), pages 81-88. Eurographics Association. 2013.
- Sipiran, Ivan, and Bustos, Benjamin: Key-component detection on 3D meshes using local features. Proc. Eurographics Workshop on 3D Object Retrieval,pp 25-32, 2012.
- Biasotti B., Bai X., Bustos B., Cerri A., Giorgi D., Li L., Mortara M., Sipiran I., Zhang S., Spagnuolo M.: SHREC'12 Track: Stability on Abstract Shapes. Proc. Eurographics Workshop on 3D Object Retrieval, pp 101-107,2012.
- Sipiran, Ivan: Local features for partial shape matching and retrieval. Proc. ACM Multimedia, pp 853-856, 2011.
- Lian, Z., Godil, A., Bustos, B., Daoudi, M., Hermans, J., Kawamura, S., Kurita, Y., Lavoue, G., Nguyen, H.V., Ohbuchi, R., Ohishi, Y., Porikli, F., Reuter, M., Sipiran, I., Smeets, D., Suetens, P., Tabia, H., and Vandermeulen, D.: SHREC'11 Track: Shape retrieval on Non-Rigid 3D Watertight Meshes, Proc. Workshop on 3D Object Retrieval (3DOR'11), pp 79-88. 2011.
- Boyer, E., Bronstein, A., Bronstein, M., Bustos, B., Darom, T., Horaud, R., Hotz, I., Keller, Y., Keustermans, J., Kovnatsky, A., Litman, R., Reininghaus, J., Sipiran, I., Smeets, D., Suetens, P., Vandermeulen, D., Zaharescu, A., and Zobel, V.: SHREC 2011: robust feature detection and description benchmark, Proc. Workshop on 3D Object Retrieval (3DOR'11), pp 71-78. 2011.
- Sipiran, Ivan, and Bustos, Benjamin: A robust 3D interest points detector based on Harris operator, Proc. Eurographics Workshop on 3D Object Retrieval, pp 7-14, 2010.
- Bronstein, A., Bronstein, M, Bustos, B., Castellani, U., Crisani, M., Falcidieno, B., Guibas, L., Kokkinos, I., Murino, V., Sipiran, I., Ovsjanikov, M., Patanè, G., Spagnuolo, M., and Sun, J.: SHREC 2010: Robust feature detection and description benchmark, Proc. Workshop on 3D Object Retrieval (3DOR'10), pp 79-86. 2010.

Tutorials

- Sipiran, I., Schreck, T.: Three-dimensional Shape Retrieval and Matching. 20th International Conference on 3D Web Technology (Web3D). 2015.
- Sipiran, I., Bustos, B.: Shape Matching for 3D Retrieval and Recognition. 26th Conference on Graphics, Patterns and Images (SIBGRAPI). 2013.

Submitted manuscripts

- Perez-Martin, J., Bustos, B., Guimaraes, S., Sipiran, I., Coello, G.: Matching & Ranking and Description Generation Techniques for Video-to-Text: A Survey. Submitted to the International Journal of Computer Vision.

Supervision of Students

Master

- Miguel Retamozo: *Automatic prediction of view-points in images*. 2019.
- Miguel Chicchon: *Data-fusion for semantic segmentation in remote sensing applications in urban environments*.2019.
- Renato Hermoza: *3D Reconstruction of incomplete archaeological objects using a generative adversarial network*. 2018.

Undergraduate

- Gerson Toribio: *Development of a visualization tool for the repair of archaeological objects using their symmetry*. 2019.

Scientific Community Service

Program Committee:

- Eurographics Workshop on 3D Object Retrieval 3DOR 2020.
- Eurographics Workshop on 3D Object Retrieval 3DOR 2019.
- Eurographics Workshop on 3D Object Retrieval 3DOR 2018.
- Eurographics Workshop on 3D Object Retrieval 3DOR 2017.
- Eurographics Workshop on 3D Object Retrieval 3DOR 2016.
- XXI Congreso Iberoamericano de Reconocimiento de Patrones 2016.
- Eurographics Workshop on 3D Object Retrieval 3DOR 2015.

Peer-reviewer for journals:

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Multimedia
- Pattern Recognition
- The Visual Computer Journal
- Expert Systems with Applications