

José M. Saavedra

✉ jose.saavedra@orand.cl



PhD in Computer Science from University of Chile, with a broad experience in R+D+i, focused on deep-learning approaches for image understanding.

Education

- 2013 **PhD in Computer Science**, *University of Chile*, Santiago, Chile.
- 2006 **MSc. in Computer Science**, *National University of Trujillo*, Trujillo, Peru.
- 2001 **Br. in Computer Science**, *National University of Trujillo*, Trujillo, Peru.
- 2001 **Informatic Engineer**, *National University of Trujillo*, Trujillo, Peru.

Academic Stay

- 2010 **TU Darmstadt Computer Science Department**, *Darmstadt, Germany*, Prof. Tobias Schreck.

PhD Thesis

- Title *Image Descriptions for Sketch-based Image Retrieval*

Master's Thesis

- Title *Improvement of the Feature Extractor for Automatic Fingerprint Recognition*

Undergraduate Thesis

- Title *Alternative Methods for Automatic Image Contrast Improvement*

Areas of Interest

Machine Learning, Computer Vision, Deep Learning, Image Processing [content-based image retrieval, anchor-free object detection, object segmentation, and self-supervised learning]

Academic/Professional Experience

- 2019-current **R&D Director**, *ORAND S.A.*, Santiago, Chile.
- 2018 **Co-founder at Impresee Inc**, *A computer vision and artificial intelligence based company settled in US, specialized in retail and banking.*
- 2013-current **Part-Time Professor**, *University of Chile*, Santiago, Chile.
Courses: *Deep Learning, Image Processing and Analysis, Visual Recognition with Deep Learning*
Incorporated as Adjunct Professor in 2017

- 2012-current **Senior Researcher**, *ORAND S.A.*, Santiago, Chile.
Areas: *Computer Vision, Deep Learning*
- 2014-2015 **Adjunct Professor**, *Pontifical Catholic University of Chile*, Santiago, Chile.
Courses: *Pattern Recognition, Image Processing*
- 2008-2012 **Teaching Assistant**, *University of Chile*, Santiago, Chile.
Courses: *Computer Science Fundamentals, Algorithms and Data Structures*
- 2001-2010 **Full-Time Professor**, *National University of Trujillo*, Trujillo, Peru.
Areas: *Data Structures, Artificial Intelligence, Computer Vision*

Academic and Industrial Awards and Distinctions

- 2016 **Winner at Start-up Competition**, e-Commerce Day Santiago, Chile.
- 2015 **CONICYT Initiation in Investigation**, Orand S.A., Chile.
- 2015 **Best Demo Award**, *Impresee: Searching in Catalogs using Photos and Sketches*, ICCV-2015, Chile.
- 2013 **CONICYT Insertion to Industry Grant**, Orand S.A., Chile.
- 2013 **3rd Best Handwritten Digit Recognition Method**, ICDAR-2013 Competition on Handwritten Digit Recognition (HDRC 2013), USA.
- 2010 **CONICYT Scholarship**, *Financial Support for PhD Thesis*, Chile.
- 2008 **CONICYT Scholarship**, *A four-year PhD scholarship*, Chile.

WoS Publications

- 2021 Andre Gustavo Hochuli, Alceu S. Britto, David A SajiS, **Jose M. Saavedra**, Robert Sabourin and Luiz Eduardo Soares de Oliveira. *A Comprehensive Comparison of End-to-End Approaches for Handwritten Digit String Recognition*. *Expert Systems with Applications (ESWA)*, 2021. DOI: <https://doi.org/10.1016/j.eswa.2020.114196>.
- 2020 Ignacio Ubeda, **Jose M. Saavedra**, Stéphane Nicolas, Caroline Petitjean and Laurent Heutte. *Improving Pattern Spotting in Historical Documents Using Feature Pyramid Networks*. *Pattern Recognition Letters (PRL)*, 2020. DOI: <https://doi.org/10.1016/j.patrec.2020.02.002>.
- 2016 Domingo Mery, Erick Svec, Marco Arias, Vladimir Rizzo, **Jose M. Saavedra**, and Sandipan Banerjee. *Modern Computer Vision Techniques for X-Ray Testing in Baggage Inspection*. *IEEE Transactions on Systems, Man, and Cybernetics Systems*, 2016. DOI: <https://doi.org/10.1109/TSMC.2016.2628381>.
- 2015 **Jose M. Saavedra**. *RST-SHELO: Sketch-based image retrieval using sketch tokens and square root normalization*. *Multimedia Tools and Applications MTAP*, Springer, 2015. DOI: <https://doi.org/10.1007/s11042-015-3076-5>.
- 2014 Violeta Chang, **Jose M. Saavedra**, Victor Castañeda, Luis Sarabia, Nancy Hitschfeld, Steffen Härtel. *Gold-standard and improved framework for sperm head segmentation*. *Computer Methods and Programs in Biomedicine CMPB*, 2014. DOI: <https://doi.org/10.1016/j.cmpb.2014.06.018>.

- 2013 Bo Li , Yijuan Lu, Afzal Godil, Tobias Schreck, Benjamin Bustos, Alfredo Ferreira, Takahiko Furuya, Manuel J. Fonseca, Henry Johan, Takahiro Matsuda, Ryutarou Ohbuchi, Pedro B. Pascoal, **Jose M. Saavedra**. *A comparison of methods for sketch-based 3D shape retrieval*. Computer Vision and Image Understanding (CVIU), September, 2013. DOI: <https://doi.org/10.1016/j.cviu.2013.11.008>.
- 2013 **Jose M. Saavedra**, Benjamin Bustos. *Sketch-based Image Retrieval Using Keyshapes*. Multimedia Tools and Applications, Springer 2013. DOI <https://doi.org/10.1007/s11042-013-1689-0>.

Scopus Publications

- 2021 Pablo Torres, **Jose M. Saavedra**. *Compact and Effective Representations for Sketch-based Image Retrieval*. Accepted in the 1st Workshop on Sketch-Oriented Deep Learning (SketchDL), CVPR 2021. <https://arxiv.org/abs/2104.10278>
- 2021 Anibal Fuentes, **Jose M. Saavedra**. *Sketch-QNet: A Quadruplet ConvNet for Color Sketch-based Image Retrieval*. Accepted in the 1st Workshop on Sketch-Oriented Deep Learning (SketchDL), CVPR 2021. <https://arxiv.org/abs/2104.11130>
- 2019 Fabian Souto, **Jose M. Saavedra**. *DLDENet: Deep Local Directional Embeddings with Increased Foreground Focal Loss for object detection*. 38th International Conference of the Chilean Computer Science Society (SCCC), Chile, 2019. DOI: <https://doi.org/10.1109/SCCC49216.2019.8966436>.
- 2019 Ignacio Ubeda, **Jose M. Saavedra**, Stéphane Nicolas, Caroline Petitjean and Laurent Heutte. *Pattern Spotting in Historical Documents Using Convolutional Models*. 5th International Workshop on Historical Document Imaging and Processing HIP'19 (ICDAR), Sydney, Australia, 2019. DOI: <https://doi.org/10.1145/3352631.3352645>.
- 2015 Juan Manuel Barrios, **Jose M. Saavedra**. *Score Propagation based on Similarity Shot Graph for Improving Visual Object Retrieval*. 3rd International Workshop on Speech, Language and Audio in Multimedia, ACM Multimedia, Brisbane, Australia, 2015. DOI: <https://doi.org/10.1145/2802558.2814644>.
- 2014 **Jose M. Saavedra**. *Handwritten Digit Recognition based on Pooling SVM-Classifiers using Orientation and Concavity based Features*. Iberoamerican Conference on Pattern Recognition (CIARP), Puerto Vallarta, Mexico, 2014. DOI https://doi.org/10.1007/978-3-319-12568-8_80.
- 2014 Markus Diem, Stefan Fiel, Florian Kleber, Robert Sablatnig, **Jose M. Saavedra**, David Contreras, Juan Manuel Barrios, Luiz S. Oliveira. *ICFHR 2014 Competition on Handwritten Digit String Recognition in Challenging Datasets (HDSRC 2014)*. International Conference on Frontiers in Handwriting Recognition ICFHR'14, Greece, 2014. DOI: <https://doi.org/10.1109/ICFHR.2014.136>.
- 2014 **Jose M. Saavedra**. *Sketch Based Image Retrieval Using a Soft Computation of the Histogram of Edge Local Orientations (S-HELO)*. International Conference on Image Processing ICIP, Paris, 2014. DOI: <https://doi.org/10.1109/ICIP.2014.7025606>.
- 2013 Bo Li, Yijuan Lu, Afzal Godil, Tobias Schreck, Masaki Aono, Henry Johan, **Jose M. Saavedra** , Shoki Tashiro. *SHREC'13 Track: Large Scale Sketch-Based 3D Shape Retrieval*. Proceedings of Eurographics Workshop on 3D Object Retrieval 2013. Girona-Spain. DOI: <https://doi.org/10.2312/3DOR/3DOR13/089-096>.

- 2013 **Jose M. Saavedra**, Benjamin Bustos, Violeta Chang. *An Accurate Hand Segmentation Approach using a Structure based Shape Localization Technique*. International Conference on Computer Vision Theory and Applications (VISAPP, 2013). Barcelona-Spain. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84878249062&partnerID=40&md5=ad06057a567587a282c88e7bae59b53f>
- 2012 B. Li, A. Godil, T. Schreck, M. Alexa, T. Boubekeur, B. Bustos, J. Chen, M. Eitz, T. Furuya, K. Hildebrand, S. Huang, H. Johan, A. Kuijper, R. Ohbuchi, R. Richter, **J. M. Saavedra**, M. Sherer, T. Yanagimachi, G. J. Yoon, S. M. Yoon. *SHREC'12 Track: Sketch-Based 3D Shape Retrieval*. Proceedings of Eurographics Workshop on 3D Object Retrieval 2012. Cagliari-Italy. DOI: <https://doi.org/10.2312/3DOR/3DOR12/109-118>.
- 2012 **J. M. Saavedra**, B. Bustos, T. Shreck, S. Yoon, M. Sherer. *Sketch-based 3D Model Retrieval using Keyshapes for Global and Local Representation*. Eurographics Workshop on 3D Object Retrieval 2012. Cagliari-Italy. DOI: <https://doi.org/10.2312/3DOR/3DOR12/047-050>.
- 2011 **Jose M. Saavedra**, Benjamin Bustos , Maximilian Scherer, Tobias Schreck. *STELA: Sketch-Based 3D Model Retrieval using a Structure-Based Local Approach*. ACM International Conference on Multimedia Retrieval 2011 , Trento-Italy. DOI: <https://doi.org/10.1145/1991996.1992022>.
- 2010 **Jose M. Saavedra**, Benjamin Bustos *An Improved Histogram of Edge Local Orientations for Sketch-Based Image Retrieval*, In Michael Goesele, Stefan Roth, Arjan Kuijper, Bernt Schiele, Konrad Schindler (ed.), 32nd Annual Symposium of the German Association for Pattern Recognition (DAGM), pp. 432-441, Sep 2010. Darmstadt, Germany. DOI: <https://doi.org/10.1109/ICIP.2014.7025606>.

Other Indexed Publications

- 2015 **Jose M. Saavedra**, Juan Manuel Barrios. *Sketch based Image Retrieval using Learned KeyShapes (LKS)*. 26th British Machine Vision Conference (BMVC), Swansea, UK, 2015. Link: <http://www.bmva.org/bmvc/2015/papers/paper164/index.html>

Patents

- 2020 Sketch-based Image Searching System using Cell-Orientation Histograms and Outline Extraction based on Medium-Level Features. <https://uspto.report/patent/grant/10,866,984>

International Doctoral Consortiums

- 2010 *Multi-Object Sketch-based Image Retrieval*, 23rd IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2010), San Francisco–USA.

International Reviewer

WACV, 2021

Journal of Multimedia Tools and Applications (Springer)

Journal of Computer & Graphics (Elsevier)

IEEE Transactions on Circuits and Systems for Video Technology

ACM Transactions on Multimedia Computing, Communications and Application
IEEE Transactions on Information Forensics & Security
Patter Recognition Letters, Elsevier.

Granted Research Projects

At ORAND S.A (Chile)

- 2019-2020 STIC-AMSUD 19-STIC-04 *Optimized Deep Learning based Representations for Computer Vision Problems.* **[National Coordinator, Chile]**
- 2018-2021 CORFO (18IEAT-93724) *Inteligencia Artificial y Visión por Computadora para potenciar el mercado de la moda a nivel mundial.* **[Director]**
- 2015-2018 FONDECYT INICIACION No 11150945: *One Shot Image / Sketch Detection on Video and Image Large Datasets.* **[Principal Researcher]**
- 2015-2016 CORFO (15ITE2-38948) *Búsqueda en Catálogos de Tiendas Usando Visión por Computador y Tecnología Móvil.* **[Co-Director]**
- 2013-2014 CORFO-L2 (12IDL2-16293) *Reconocimiento de texto manuscrito, verificación de autenticidad y aseguramiento de integridad de documentos digitalizados.* **[Principal Researcher]**
- 2013-2015 CONICYT-PAI (78120425) *Desarrollo de nuevas tecnologías basadas en visión computacional para mejorar los canales de entrega de servicios en la industria bancaria y del retail así como para acercar la tecnología basada en búsqueda de imágenes a grupos minoritarios.* **[Principal Researcher]**
- 2014-2015 STIC-AMSUD *Dynamic Selection of Classifiers with Application in Real Environments.* **[Researcher]**

Supervised Posgraduate Thesis

- 2020 Pattern Spotting in Historical Documents using Convolutional Models. Author: Ignacio Úbeda. Thesis to obtain the Master degree at DII-UChile
- 2020 Deep Local Directional Embeddings para detección de objetos. Author: Fabián Souto. Thesis to obtain the Master degree in Computer Science at DCC-UChile
- 2020 Mejora de la Generalización de Clasificadores Convolucionales ya entrenados, usando Feedback Visual de Usuario. Author: Andrés Ferrada. Thesis to obtain the Master degree in Computer Science at DCC-UChile
- 2018 Using Automatic Clothing Labeling to Improve The Quality of Clothing Retrieval Systems. Author: Camila Álvarez. Thesis to obtain the Master degree in Computer Science at DCC-UChile

Supervised Undegraduate Thesis

- 2020 Detección y clasificación de grietas en asfalto mediante redes convolucionales y procesamiento de imágenes. Author: Claudio Urbina, DIE-University of Chile.
- 2020 Detección de prendas de vestir utilizando modelos de detección de objetos basados en deep learning. Author: Simón Sepúlveda, DIE-University of Chile.
- 2020 Traductor Automático de Manga. Author: Raúl Rayo, DCC-University of Chile.

- 2020 Recuperación de imágenes basada en dibujos mediante redes convolucionales. Author: Anibal Fuentes, DIE-University of Chile.
- 2020 Reconocimiento de Montos Manuscritos en Cheques a través de Modelos de Detección de Objetos basados en Redes Convolucionales. Author: David Saji, DCC-University of Chile.
- 2019 Clasificación de Usuarios de Instagram en base a Texto e Imágenes. Author: Maximiliano Kauer, DCC-University of Chile.
- 2018 Búsqueda en Videos Utilizando Redes Neuronales Convolucionales. Author: Sebastian Ormeño, DCC-UChile
- 2014 Diseño e Implementación de Sistema de Detección Automática de Publicidad en Prensa Escrita. Author: Maximiliano Ramírez, DIE-UChile
- 2006 An Image Segmentation Algorithm Design applying the Mumford-Shah Functional. Authors: Anali Alfaro Alfaro & Ivan Sipiran Mendoza. UNT-Perú
- 2006 Facial Geometric Feature Extraction using Active Contours. Authors: Jorge Bravo Escalante & Yesenia Alayo La Rosa. UNT-Perú
- 2004 Automatization of the Process of Template Serializing in the Context of Footwear Manufacturing. Author: Maria Isabel Ganoza. UNT-Perú

Program Committee

- 2019 SIMBig 2019, Conferencia Internacional sobre Gestión de la Información y Big Data
- From 2018 CIARP, Congress on Pattern Recognition
- From 2015 ICPRAM, International Conference on Pattern Recognition Applications and Methods

Academic References

1. **Nancy Hitschfeld**. Professor at University of Chile, Chile.
nancy@dcc.uchile.cl.
2. **Domingo Mery**. Professor at Pontifical Catholic University of Chile, Chile.
domingo.mery@uc.cl.
3. **Laurent Heutte**. Director of LITIS Lab, University of Rouen Normandy, France.
Laurent.Heutte@univ-rouen.fr.
4. **Alceu de Souza Britto Jr**. Professor at Pontifical Catholic University of Parana, Brazil.
alceu@ppgia.pucpr.br.