

Curriculum Vitae – Dr. Rodrigo VERSCHAE

Dr. Rodrigo VERSCHAE

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- SHORT BIO ◇ **Dr. Verschae** is an active researcher with experience in applied research and with over 30 publications in international conferences and journals in the areas of computer vision and machine learning. His current research interests include computer vision, machine learning, object detection and recognition, face analysis, and scene understanding.
- EDUCATION ◇ **Universidad de Chile**, Santiago, Chile – www.uchile.cl
- *Doctor in Electrical Engineering*. No examination grade is given. (2005 - 2010)
 - Title: Object Detection Using Nested Cascades of Boosted Classifiers
 - Advisor: Prof. Dr. Javier Ruiz-del-Solar
 - Jury:
 - * Prof. Dr. Jean-Philippe Thiran (École Polytechnique Fédérale de Lausanne),
 - * Prof. Dr. Alvaro Soto (Universidad Católica de Chile),
 - * Prof. Dr. Pablo Estevez (Universidad de Chile),
 - * Prof. Dr. Doris Saez (Universidad de Chile).
 - *Civil Electrical Engineer*, graduated with highest honors. (1996-2003)
 - *Licentiate diploma in Computer Engineering*, with honors. (1996-2002)
 - *Licentiate diploma in Electrical Engineering*. (1996-2001)
- ◇ **École Normale Supérieure (ENS) de Cachan**, Paris, France – www.ens-cachan.fr
Center for Mathematics and Their Applications (CMLA)
- *Master 2 in Applied Mathematics*. (October 2005 – August 2006)
Program: Mathematics, Vision and Learning.
- ◇ **Max Planck Institute**, Tübingen, Germany – www.mlss.cc
- Machine Learning Summer School. (19 - 30 August, 2007)
- APPOINTMENTS ◇ **Research Collaborator** (April 2010 – present),
Advanced Mining Technology Center (AMTC), Universidad de Chile, Chile.
- ◇ **Research Fellow** (July 2009 – March 2010),
Network Design Research Center (NDRC), Kyushu Institute of Technology, Fukuoka, Japan.
- ◇ **Research Associate** (November 2004 – March 2005),
Dept. of Pattern Recognition, Fraunhofer IPK Institute, Berlin, Germany.
- ◇ **Research Collaborator** (April 2004 – December 2004),
Center for Web Research, Universidad de Chile, Santiago, Chile.
- ◇ **Research Assistant** (June 2002 – August 2003),
Computer Vision Laboratory and Center for Web Research, Universidad de Chile, Chile.
- RESEARCH INTERESTS Computer vision, machine learning, pattern recognition, image processing, object detection, object recognition, image understanding, face analysis and multimedia retrieval.
- PUBLICATION SUMMARY 1 book chapter, 1 doctoral thesis, 2 master theses, 8 journal articles and 22 peer-reviewed conference papers.

- RESEARCH VISITS & STAYS
- ◇ **Research Visit** (April – May 2010),
Network Design Research Center (NDRC), Kyushu Institute of Technology, Japan.
 - ◇ **Short Stay** (September – October 2008),
Image Processing Group, Pompeu Fabra University, Barcelona.
 - ◇ **Long Stay** (March – August 2007),
Center for Mathematics and Their Applications (CMLA), ENS Cachan, France.
 - ◇ **Research Visit** (October 2003 – October 2004),
Dept. of Pattern Recognition, Fraunhofer IPK, Berlin, Germany.
- TEACHING EXPERIENCE
- ◇ **Gjovik College University, Norway**
 - **External Reviewer:**
 - Machine Learning and Pattern Recognition (Lecture, 2011).
 - Behavior based Classification of Botnet Malware (Master, 2011).
 - Digital Forensics Tool Testing. Image Metadata in the Cloud (Master, 2011).
 - ◇ **Department of Electrical Engineering, Universidad de Chile, Chile**
 - **Master Thesis, Member of the reviewing committie**
 - Matias Arenas. *Detection and Tracking of Articulated Robots using Computational Image Analysis*, Universidad de Chile. (2009)
 - **Engineering Thesis Co-Supervisor**
 - Oscar Sanhueza. *Analysis and Detection of Facial Features using Statistical Learning*, Universidad de Chile. (2008)
 - Hardy Francke. *Design and Building of a Hand Gestures Human Computer Interface*, Universidad de Chile. (2007)
 - **Teaching Assistant:**
 - Advanced Image Processing (1 semester, 2008).
 - Information Processing Systems (1 semester, 2001).
 - Networks Analysis (3 semesters, 1999 – 2001).
 - ◇ **Fraunhofer IPK, Germany**
 - **Eng. Thesis co-advisor:** Olano. A., *Skin detection using the Fuzzy Integral*. (2004)
- GRANTS, AWARDS & FELLOWSHIPS
- ◇ **BecasChile fellowship** (2011) Postdoctoral grant for a 7-months research visit at Kyushu Institute of Technology, Fukuoka, Japan, awarded by BecasChile, Conicyt, Chile.
 - ◇ **MECESUP2 fellowship** (2009) Fellowship awarded by the MECESUP2 program (Chile) for the last period (6 months) of the Doctoral studies at Universidad de Chile.
 - ◇ **VAA research visit grant** (September – October, 2008). Grant awarded by the Academic Affairs Department (VAA), Universidad de Chile, for a research visit (2 months) at the Image Processing Group, Pompeu Fabra University, Barcelona, Spain.
 - ◇ **ECCV student grant** (September 2008). Grant awarded by the organizers of the European Conference on Computer Vision (ECCV), Marseille, France.
 - ◇ **ALFA fellowship** (Oct 2005 - Sept 2006 and March - Sept 2007). Fellowship granted by the ALFA Network in Computer Vision for doing a research visit (12+6 months) at Center for Applied Mathematics (CMLA), École Normale Supérieure (ENS) de Cachan, France.
 - ◇ **CONICYT doctoral fellowship** (2005-2008). Fellowship awarded by CONICYT (Science and Technology Chilean Commission) to pursue Doctoral studies at Universidad de Chile.
 - ◇ **1st place, RAS poster competition**, joint work with Matias Arenas, *Detection of AIBO and Humanoid Robots using Boosted Cascades*, IEEE RAS (Robotics and Automation Society) Latin-American Summer School on Robotics, Chile. (2007)

- APPLIED RESEARCH
- ◇ **FaceQS-Tool:** Development, design and implementation of a face detector, an eye detector and a pose estimator, software licenced to the Fraunhofer-IPK Institute, Berlin, Germany, and the Bundesdruckerei GmbH (Federal German printing office) for their e-passport production system. System used to check whether the submitted images fulfils the ICAO standard. Work done at Universidad de Chile (2005).
 - ◇ **Art image retrieval using mobile devices:** Development of one of the retrieval algorithms and of web interface of a system that got the 4th place in the innovation price Berlin/Brandenburg 2004. Work done at the Dept. of Pattern Recognition, Fraunhofer IPK, Berlin, Germany.
 - ◇ **ETHICAL:** FP7 project of the European Commission for “Promoting International Debate on Ethical Implications of Data Collection, use and retention for Biometric and Medical Applications”, the project involved 8 institutions from Europe and the world. Part of Universidad de Chile working group: editor of 1 deliverable, attended project meetings, etc.
- SOFTWARE
- ◇ **Projects/Institutions** that have used some of the developed algorithms:
 - The Webfaces project, Center for Web Research, Universidad de Chile (2004).
 - IBM-Watson research, USA (collaboration for TRECVID-2003).
 - The Fraunhofer-IPK Institute, Berlin, Germany (2004, 2005).
 - Teams of the Universidad de Chile participating in the Robocup competitions (2005-2010: Humaniod’s, Aibo’s and Nao’s teams).
 - The Bundesdruckerei BmbH, Germany (2005).
- SKILLS
- ◇ **Programming:** Proficient in C. Experienced in JAVA, C++, Bash/Awk and OpenMP for C. Familiar with MPI for C and PHP. Basic Knowledge of Python, Go, etc.
 - ◇ **Versioning:** Familiar with GIT and SubVersion (SVN).
 - ◇ **Data analysis:** Familiar with Matlab/Octave, WEKA, gnuplot and R.
 - ◇ **Operating Systems:** Experienced with GNU/Linux. Familiar with OSX and MS-Windows.
 - ◇ **Publishing:** Experienced with L^AT_EX.
- LANGUAGES
- ◇ Native *Spanish*.
 - ◇ Fluent *English*.
 - ◇ Intermediate-Advanced *French* (not used much during the last four years)
 - reading, listening: advanced
 - speaking: intermediate
 - ◇ Basic-Intermediate *German* (not used much during the last six years)
 - reading, listening: intermediate
 - speaking: basic-intermediate
 - ◇ Basic *Japanese*.

- OTHER ACTIVITIES
- ◇ **Part of the ALFA Network** in Computer Vision (2005 – 2008). European program for Latin-american and European Doctoral students working in the field of Computer Vision.
 - ◇ **Member of:** (1) the IEEE Society since 1999, (2) the IEEE Computational Intelligence Society since 2005, and (3) the IEEE Systems, Man, and Cybernetics Society since 2005.
 - ◇ **International Conferences**
 - Web/Local Chair: WSC14 (2009).
 - Track Chair: ICETET (2009).
 - Program Committee: PSIVT (2007), HIS (2010).
 - Reviewer: SPIRE (2005), WSC10 (2005), LA-WEB (2005), IVCNZ (2009), ISNN (2009).
 - ◇ **International Journals:**
 - Reviewer: IJHIS (2005), IJCIR (2005), IEE VIS (2006 and 2007), MVA (2007), IJCV (2009), SIMPAT (2010), COMPELECENG (2010 and 2011).
 - ◇ **Attended Conferences:**
 - ICIAP (2003, 2005), ICIP (2004, 2005), ECCV (2006, 2008), HIS (2008), ICPR (2010).
 - ◇ **Attended Workshops and Symposiums:**
 - Computer Vision Foundations and Applications, 10 - 11 March, 2008, Paris, France.
 - Biologically-Inspired Computing, 3 - 7 December, 2007, Valparaiso, Chile.
 - Computer Vision Based Analysis in Sport Environments, ECCV'2006, Graz, Germany.
 - Vision by Brains and Machines, 13 - 17 November, 2006, Montevideo, Uruguay.
 - School on Neuromathematics of Vision, 4 - 9 September, 2006, Pisa, Italy.
 - Mathematical Foundations of Learning Theory II, 31 May - 3 June, 2006, Paris, France.
 - ◇ Member of the University Basketball Team, Universidad de Chile, Chile. (1998 - 2002)
 - ◇ Research Assistant (Part-time), Speech Processing and Transmission Laboratory, Universidad de Chile, Chile. (2001)
 - ◇ Research Assistant (Part-time), Classification of defects on wood boards, Dept. Electrical Engineering, Universidad de Chile, Chile. (2000)
 - ◇ Member of head of the IEEE student branch, Universidad de Chile, Chile. (2000)
 - ◇ Internships
 - Netcas (IT company), Santiago, Chile (Summer 2001): Technical and economical analysis of hardware and software for an internet server.
 - ENAP (Chilean National Oil Company), Punta Arenas, Chile (Summer 2000): Evaluation of the installation of a new generator in a processing plant.
 - Sonda (IT company), Santiago, Chile (Summer 1999): Technical support department.
- PERSONAL DATA
- ◇ Full Name: Rodrigo Andrés Verschae Tannenbaum.
 - ◇ Citizenship: Chilean and Belgian.
 - ◇ Country of Residence and Status: Japan, Spouse Visa.
 - ◇ Marital Status: Married.
 - ◇ Birthdate and Birthplace: February 22th, 1978, Santiago, Chile.
 - ◇ Other interests: photography (<http://rodrigo.verschae.org/flogr>), sports (roller skating, trekking, biking, etc.), cooking, traveling, experiencing different cultures.

REFEREES ♦ More references available on request

PRESENTATIONS

- ♦ *Robot and Object Detection using Boosted Classifiers*, VII IEEE LA Summer School on Computational Intelligence and IV IEEE LA Summer School on Robotics, EVIC'2010, December 15 - 17, 2010, Santiago, Chile.
- ♦ *Face Recognition in Unconstrained Environments: A Comparative Study*, Faces in Real-Life Images: Detection, Alignment, and Recognition Workshop, European Conference in Computer Vision (ECCV'08), October 17, 2008, Marseille, France.
- ♦ *Multiclass object detection: nested cascades, vectorized Adaboost and coupled components*, ALFA workshop in Computer Vision Foundations and Applications, 10-11 March, 2008, Paris, France.
- ♦ *Face detection using boosted nested cascades*, School on Neuromathematics of Vision, Centro di Ricerca Matematica Ennio De Giorgi, 4 - 9 September, 2006, Pisa, Italia.
- ♦ *Object detection using cascades of boosted classifiers*, given together with Prof. J. Ruiz-del-Solar at the Third Latin-American Summer School on Computational Intelligence, EVIC'2006, December 13 - 15, 2006, Santiago, Chile.
- ♦ *State of the Art Face Detection: Cascade Boosting Approaches*, given together with Prof. J. Ruiz-del-Solar at the Tenth Online World Conference on Soft Computing (WSC10), September 19th - October 07th, 2005, On the World Wide Web.
- ♦ *Face detection using statistical learning techniques*, given together with Prof. J. Ruiz-del-Solar at the First Latin-American Summer School on Computational Intelligence, EVIC'2004, December 13 - 15, 2004, Santiago, Chile.

PUBLICATIONS

INTER-
NATIONAL
JOURNALS

- [J1] Correa M., Hermosilla G., Verschae R., Ruiz-del-Solar J., "Human Detection and Identification by Robot using Thermal and Visual Information in Domestic Environments", In Journal of Intelligent and Robotic Systems (in press), 2011
- [J2] Verschae, R., Koeppen, M., Yoshida, K., (2011) *Partial user-supplied information and user modeling for improving QoS*, In International Journal on Simulation Modelling Practice and Theory (SIMPAT) vol. 19, no. 1, pp. 47-55, 2011
- [J3] Ruiz-del-Solar J., Verschae R., Arenas M., Loncomilla P., (2010) Play Ball! Fast and Accurate Multiclass Visual Detection of Robots and its Application to Behavior Recognition, In Robotics Automation Magazine, IEEE, vol. 17, no. 4, pp. 43 -53, 2010
- [J4] Arenas M., Ruiz-del-Solar J., Verschae R., Loncomilla P. (2010) *Visual Detection of Legged Robots and Its Application to Robot Soccer Playing and Refereeing*, In International Journal on Humanoid Robotics, vol. 7, no. 4, pp. 669-698, 2010.
- [J5] Ruiz-del-Solar, J., Verschae, R., Correa, M. (2009) *Recognition of Faces in Unconstrained Environments: A Comparative Study*, EURASIP Journal on Advances in Signal Processing, special issue "Recent Advances in Biometric Systems: A Signal Processing Perspective", vol 2009, Article ID 184617, 19 pages.
- [J6] Verschae, R., Ruiz-del-Solar, J., and Correa, M., (2008) *A Unified Learning Framework for object Detection and Classification using Nested Cascades of Boosted Classifiers*, Machine Vision and Applications, 19(2): 85-103.
- [J7] Soria-Frisch, A., Verschae, R., Olano, A. (2007), *Fuzzy fusion for skin detection*, Fuzzy Sets and Systems, 158(3): pp. 325-336.
- [J8] Jaimes, A., Ruiz-del-Solar, J., Verschae, R., Yaksic, D., Baeza-Yates, R., Davis, E., Castillo, C. (2004). *On the Image Content of the Web in Chile*, Journal of Web Engineering, Vol. 3, No. 2, pp. 153-168.

THESES AND
BOOK
CHAPTERS

- [B1] Verschae R. (2010) *Object Detection Using Nested Cascades of Boosted Classifiers: A learning framework and its extension to the multi-class case*. Thesis work to obtain the Doctoral Degree in Electrical Engineering, Dept. of Electrical Eng., Universidad de Chile.
- [B2] Verschae R., Ruiz-del-Solar, J., (2006) *State of the Art Face Detection: Cascade Boosting Approaches*, in Tiwari, A.; Knowles, J.; Avineri, E.; Dahal, K.; Roy, R. (Eds.), *Applications of Soft Computing: Recent Trends*, Springer.
- [B3] Verschae R. (2006). *Improvement of a face detection system using A-contario Validation methods*, Thesis work to obtain the M.Sc degree, CMLA, ENS Cachan, France.
- [B4] Verschae R. (2003). *Face detection in Image Databases (in Spanish)*, Thesis work to obtain the Electrical Enginner degree, Dept. of Electrical Eng., Universidad de Chile.

PEER
REVIEWED
CONFER-
ENCES

- [1] Koeppen M., Verschae R., Yoshida K., Tsuru M., (2010) "Comparison of Evolutionary Multi-Objective Optimization Algorithms for the Utilization of Fairness in Network Control", In SCM 2010.
- [2] Verschae R., Ruiz-del-Solar J.(2010), Coarse-To-Fine Multiclass Nested Cascades for Object Detection (2010), In International Conference on Pattern Recognition (ICPR 2010), IEEE Computer Society, pp. 344-347, 2010.
- [3] Lee-Ferng J., Ruiz-del-Solar J., Correa M., Verschae R. (2010), Hand Gesture Recognition for Human Robot Interaction in Uncontrolled Environments, Workshop on Multimodal Human - Robot Interfaces, 2010 IEEE International Conference on Robotics and Automation May 3, 2010, Anchorage, Alaska (to appear)
- [4] Verschae R., Koeppen M., Yoshida K. (2009) *User Modeling for Improving QoS using partial user supplied information*, WIND'09 Workshop, INCoS'09 (in press)
- [5] Ruiz-del-Solar J., Mascaro M., Correa M., Bernuy F., Riquelme R., Verschae R., (2009) *Analyzing the Human-Robot Interaction Abilities of a General-Purpose Social Robot in Different Naturalistic Environments*, In Lecture Notes in Computer Science (RoboCup Symposium 2009), vol. 5949, pp. 308-319, 2010
- [6] Ruiz-del-Solar J., Verschae R., Correa M., Lee-Ferng J., Castillo N., (2009) *Real-Time Hand Gesture Recognition for Human Robot Interaction*, Robocup Symposium'2009
- [7] Verschae, R., Ruiz-del-Solar, J, Correa, M. (2008) *Face Recognition in Unconstrained Environments: A Comparative Study*, ECCV'08 workshop Faces in Real-Life Images: Detection, Alignment, and Recognition, Marseille, France (CD proceedings).
- [8] Verschae, R., Ruiz-del-Solar, J. (2008) *Multiclass Adaboost and Coupled Classifiers for Object Detection*, CIARP'08, Lecture Notes in Computer Science 5197, pp. 560-567.
- [9] Francke H., Ruiz-del-Solar J., Verschae R., (2007) *Real-Time Hand Gesture Detection and Recognition Using Boosted Classifiers and Active Learning*, PSIVT 2007, Lecture Notes in Computer Science 4872, pp. 533-547.
- [10] Arenas, M., Ruiz-del-Solar J., Verschae R., (2007) *Detection of Aibo and Humanoid Robots using Cascades of Boosted Classifiers*, Lecture Notes in Computer Science 5001, pp. 449-456, RoboCup Symposium 2007
- [11] Ruiz-del-Solar, J., Verschae, R., Vallejos, P., Correa, M. (2007) *Face Analysis For Human Computer Interaction Applications*, Proceedings of the 2nd Int. Conf. on Computer Vision Theory and Applications, VISAPP 2007, Barcelona, Spain.
- [12] Verschae R., Ruiz-del-Solar, J., Correa M. 2006), *Gender Classification of Faces using Adaboost*, CIARP 2006, Lecture Notes in Computer Science 4225, pp.68-78.
- [13] Verschae, R., Ruiz-del-solar, J., Köppen, J., Vicente-Garcia, R. (2005). *Improvement of a Face Detection System by Evolutionary Multi-Objective Optimization*, Fifth International conference on Hybrid Intelligent Systems (HIS'05), pp. 361-366.

- [14] Ruiz-del-Solar, J., Castañeda, V., Verschae, R., Baeza-Yates, R., Ortiz, F. (2005). *Characterizing Objectionable Image Content (Pornography and Nude Images) of specific Web Segments: Chile as a case study*, Proc. of LA-Web, pp. 269-278.
- [15] Olano, A., Soria-Frisch, A., Verschae, R. (2005). *Robust skin detection based on the fuzzy integral*, Fourth Conference of the European Society for Fuzzy Logic and Technology - EUSFLAT 2005, Barcelona, September 7-9, 2005.
- [16] Ruiz-del-Solar, J., Verschae, R., and Kottow, D. (2005). *Skin Detection in Videos in the Spatial-Range Domain*, Lecture Notes in Computer Science 3617, pp. 961-969.
- [17] Baeza-Yates, R., Ruiz-del-Solar, J., Verschae, R., Castillo, C., Hurtado, C. (2004). *Content-based Image Retrieval and Characterization on Specific Web Collections*, Lecture Notes in Computer Science 3115, Springer, 189-198.
- [18] Ruiz-del-Solar, J. and Verschae, R. (2004). *Robust Skin Segmentation using Neighborhood Information*, Int. Conf. on Image Processing – ICIP'04, Singapore, IEEE Press.
- [19] Ruiz-del-Solar, J. and Verschae, R. (2004). *Skin Detection using Neighborhood Information*, Proc. of the 6th Int. Conf. on Face and Gesture Recognition - FG2004, pp. 463-468, Seoul, Korea, IEEE Press.
- [20] Verschae, R., and Ruiz-del-Solar, J. (2003). *A Hybrid Face Detector based on an Asymmetrical Adaboost Cascade Detector and a Wavelet-Bayesian-Detector*, Lecture Notes in Computer Science 2686, pp. 742-749.
- [21] Jaimes, A., Ruiz-del-Solar, J., Verschae, R., Yaksic, D., Baeza-Yates, R., Davis, E., Castillo, C. (2003). *On the Image Content of the Web in Chile*, Proc. of the First Latin American Web Congress, pp. 72-83, Nov. 10-12, Santiago, Chile, IEEE Press.
- [22] Ruiz-del-Solar, J., Shats, A. and Verschae, R. (2003). *Real-Time Tracking of Multiple Persons*, Proc. of the 12th Int. Conf. on Image Analysis and Processing - ICIAP 2003, pp. 109-113, September, Mantova, Italy, IEEE Press.
- MAGAZINE PAPERS
- [M1] Correa, M., Ruiz-del-Solar, J. and Verschae, R. (2006) *Indexación Automatizada de Imágenes Digitales usando Información Facial*, Anales del Instituto de Ingenieros de Chile, Vol. 118, No. 3, pp. 93-105.
- [M2] Verschae, R., and Ruiz-del-Solar, J. (2003) *Detección de Caras utilizando un Método Híbrido de Reconocimiento Estadístico de Patrones*, Anales del Instituto de Ingenieros de Chile, Vol. 115, No. 2, pp. 67-79.