

# SILVIA CORCHS

## Education

- 2010 – 2014 **PhD in Informatics**  
Department of Informatics, Systems and Communication, University of Milano Bicocca, Italy.
- 1990 – 1994 **PhD in Physics**  
Department of Physics, Universidad Nacional de Rosario, Argentina.
- 1984 – 1990 **Master in Physics**  
Department of Physics, Universidad Nacional de Rosario, Argentina

## Research Experience

- 2017-2019 **Senior Research Fellow**, Multimedia Signal Processing Lab, Department of Informatics, Systems and Communication, University of Milano Bicocca, Italy.
- 2013-2016 **Senior Research Fellow**, Imaging and Vision Lab, Department of Informatics, Systems and Communication, University of Milano Bicocca, Italy.
- 2010-2012 **PhD Fellow**, Department of Informatics, Systems and Communication, University of Milano Bicocca, Italy. Fellowship funded by Ocè-Canon.
- 2009 **Research Fellow**, Imaging and Vision Lab, Department of Informatics, Systems and Communication, University of Milano Bicocca, Italy.
- 2005-2007 **Postdoc Scientist**, Institute of Neural Information Processing, University of Ulm, Germany.
- 2003-2005 **Postdoc Scientist**, Imaging and Vision Lab, Department of Informatics, Systems and Communication, University of Milano Bicocca, Italy.
- 1999-2003 **Guest Scientist**, Computational Neuroscience Group, Neural Computing Section of Siemens Corporate Research Center, Siemens AG, Munich, Germany.
- 1995-2002 **Researcher**, National Council for Research and Universidad Nacional de Rosario, Argentina, Department of Physics.

## Teaching Experience

- 2014 – 2021 **Teaching Assistant**, Department of Informatics, Systems and Communication, University of Milano Bicocca, Italy. Courses: *Informatics, Multimedia data processing, Digital Imaging*.
- 2006 – 2007 **Teaching Assistant of the course “Natural Computation: Modelling Information Processing in Biological Systems”**. Institute of Neural Information Processing, Faculty of Engineering and Computer Science, University of Ulm, Germany.
- 1993 – 1999 **Teaching Assistant of the courses: “General Physics” and “Quantum Mechanics”**  
Department of Physics, Universidad Nacional de Rosario, Argentina.

## Languages

	Understanding	Speaking	Writing	Reading
Spanish	Mother tongue			
English	C2	C2	C1	C2
Italian	C2	C2	C2	C2
French	B2	B2	B1	B2
German	B1	B1	A2	B1

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user

## Publications

- Patents: 4
- Journal articles: 32
- Book chapters: 3
- Conference proceedings: 30
- Conference abstracts: 14

## Patents

1. **Method for correcting a digital image.** Alessandro Capra, Alfio Castorina, Silvia Corchs, Francesca Gasparini, Raimondo Schettini. Patent number US 7881554, 2011.
2. **Evaluation of images of the brain obtained by means of functional magnetic resonance tomography.** Silvia Corchs, Gustavo Deco, Bernd Schurmann, Martin Stetter, Jan Storck. Siemens AG, EP Patent 1456798. US Patent 2005/0119558 A1, 2005.
3. **Arrangement with artificial neurons for describing the transmission behavior of a nerve cell to be excited and method for determining the transmission behavior of a nerve cell to be excited using artificial neurons.** Bernd Schurmann, Martin Stetter, Gustavo Deco, Jan Storck, Silvia Corchs. Siemens AG, EP Patent 1425679. US Patent 2004/0234508 A1, 2002.
4. **Arrangement for determining the position of an object in an image whereby the apparatus can be trained,** Silvia Corchs and Gustavo Deco. Siemens AG, DE Patent 10050062, 2002.

## Journal Articles

1. **Ensemble learning on visual and textual data for social image emotion classification.** Silvia Corchs, Elisabetta Fersini and Francesca Gasparini. *International Journal of Machine Learning and Cybernetics* 10 (8), 2057-2070, 2019.
2. **Clustering the brain with “CluB”: A new toolbox for quantitative meta-analysis of neuroimaging data.** Berlinger, M., Devoto, F., Gasparini, F., Saibene, A., Corchs, S., Clemente, L., Danelli, L., Gallucci, M., Borgoni, R. Borghese, N. and Paulesu, E. *Frontiers in Neuroscience*, 13, 1037, 2019.
3. **Computational Methods for Resting-State EEG of Patients with Disorders of Consciousness.** Corchs, S., Chioma, G., Dondi, R., Gasparini, F., Manzoni, S., Markowska-Kaczmar, U., Mauri, G., Zoppis I. and Morreale, A. *Frontiers in Neuroscience*, 13, 807, 2019.
4. **Databases for evaluating interferences between affective content and image quality.** Francesca Gasparini, Gianluigi Ciocca and Silvia Corchs. *Data in Brief*, vol. 23, 103700, 2019.

5. **Auditory Saliency Classification Using EEG Data.** Silvia Corchs and Francesca Gasparini. *Frontiers in Signal Processing*, vol. 1, Isaac Scientific Publishing pp 17-23, 2017.
6. **A Genetic Programming approach to evaluate complexity of texture images.** Silvia Corchs, Gianluigi Ciocca, Francesca Gasparini. *Journal of Electronic Imaging* 25(6), 061408 1-10, 2016.
7. **Predicting complexity perception of real world images.** Silvia Corchs, Gianluigi Ciocca, Emanuela Bricolo, Francesca Gasparini. *PLoS ONE* 11(6): e0157986, 2016.
8. **No Reference Image Quality classification for JPEG-Distorted Images.** Silvia Corchs, Francesca Gasparini, Raimondo Schettini. *In Digital Signal Processing*, vol. 30, pp. 86-100, Elsevier, 2014.
9. **How to assess image quality within a workflow chain: an overview.** Gianluigi Ciocca, Silvia Corchs, Francesca Gasparini, Raimondo Schettini. *In International Journal on Digital Libraries*, vol. 15, number 1, pp. 1-25, Springer, 2014.
10. **Underwater image processing: state of the art of restoration and image enhancement methods.** Raimondo Schettini and Silvia Corchs. *In EURASIP Journal on Advances in Signal Processing*, vol. 2010, pp. 1-14, Hindawi Publishing Corporation, 2010.
11. **A contrast image correction method.** Raimondo Schettini, Francesca Gasparini, Silvia Corchs, Fabrizio Marini, Alessandro Capra and Alfio Castorina. *In Journal of Electronic Imaging*, vol. 19, number 2, pp. 1-11, 2010.
12. **Recall or precision oriented strategies for binary classification of skin pixels.** Francesca Gasparini, Silvia Corchs, Raimondo Schettini. *In Journal of Electronic Imaging*, vol. 17, number 2, pp. 1-15, 2008.
13. **Low Quality Image Enhancement Using Visual Attention.** Francesca Gasparini, Silvia Corchs, Raimondo Schettini. *In Optical Engineering*, vol. 46, pp. 040502 (1-3), 2007.
14. **A recall or precision oriented skin classifier using binary combining strategies.** Francesca Gasparini, Silvia Corchs, Raimondo Schettini. *In Pattern Recognition*, vol. 38, number 1, pp. 2204-2207, 2005.
15. **Feature-based attention in human visual cortex: simulation of fMRI data.** Silvia Corchs, Gustavo Deco. *In NeuroImage*, vol. 21, number 1, pp. 36-45, Academic Press, 2004.
16. **Systems-level neuronal modeling of visual attentional mechanisms.** Silvia Corchs, Martin Stetter, Gustavo Deco. *In Artificial Intelligence Review*, vol. 20, number 1-2, pp. 143-160, Springer, 2003.
17. **A neurodynamical model to simulate neural activities in visual attention experiments.** Silvia Corchs, Gustavo Deco. *In Neurocomputing*, vol. 44, pp. 759-767, Elsevier, 2002.
18. **Large-scale neural model for visual attention: integration of experimental single-cell and fMRI data.** Silvia Corchs, Gustavo Deco. *In Cerebral Cortex*, vol. 12, number 4, pp. 339-348, Oxford Univ. Press, 2002.
19. **A neurodynamical model for selective visual attention using oscillators.** Silvia Corchs, Gustavo Deco. *In Neural Networks*, vol. 14, number 8, pp. 981-990, Elsevier, 2001.
20. **Selective attention in visual search: A neural network of phase oscillators.** Silvia Corchs, Gustavo Deco. *In Neurocomputing*, vol. 38, pp. 1151-1160, Elsevier, 2001.
21. **Electronic capture by He 2+ from atomic and molecular hydrogen.** MM Sant'Anna, WS Melo, ACF Santos, VLB Jesus, MB Shah, GM Sigaud, EC Montenegro, HF Busnengo, Silvia Corchs, RD Rivarola. *In Physical Review A*, vol. 61, number 5, pp. 052717, APS, 2000.
22. **Importance of the multicenter character of molecular aggregates in the theoretical description of the charge transfer process.** Silvia Corchs, HF Busnengo, RD Rivarola. *In Nuclear Instruments and Methods*

*in Physics Research Section B: Beam Interactions with Materials and Atoms*, vol. 149, number 3, pp. 247-256, Elsevier, 1999.

23. **High-Order Contributions of the Born Series with Correct Boundary Conditions.** Silvia Corchs, OA Fojon, RD Rivarola. *In Physica Scripta*, vol. 1999, number T80B, pp. 422, IOP Publishing, 1999.
24. **Electron capture to selective excited states in ion--H 2 collisions.** HF Busnengo, Silvia Corchs, RD Rivarola. *In Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, vol. 146, number 1, pp. 52-56, North-Holland, 1998.
25. **Single electron capture from molecular hydrogen targets by impact of protons and alpha particles.** H.F Busnengo, Silvia Corchs, RD Rivarola. *In Physical Review A*, vol. 57, number 4, pp. 2701, APS, 1998.
26. **Differential cross sections for electron capture from H 2+ within the continuum-distorted-wave approximation.** HF Busnengo, Silvia Corchs, RD Rivarola. *In Physical Review A*, vol. 56, number 1, pp. 1042, APS, 1997.
27. **Single electron capture by impact of multicharged ions.** HF Busnengo, Silvia Corchs, AE Martinez, RD Rivarola. *In Physica scripta*, vol. 1997, number T73, pp. 242, IOP Publishing, 1997.
28. **Independent center, independent electron approximation for dynamics of molecules and clusters.** JH McGuire, Jack Straton, J Wang, YD Wang, OL Weaver, Silvia Corchs, RD Rivarola. *In The Journal of chemical physics*, vol. 105, number 5, pp. 1846-1856, AIP Publishing, 1996.
29. **Interference effects in collisions between heavy ions and molecular targets.** Silvia Corchs, HF Busnengo, RD Rivarola, JH McGuire. *In Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, vol. 117, number 1, pp. 41-46, Elsevier, 1996.
30. **Total cross-sections for single electron capture from H, He and H2 targets by impact of Be4+ and B5+ ions.** HF Busnengo, Silvia Corchs, AE Martinez, RD Rivarola. *In Physica Scripta*, vol. 1996, number T62, pp. 88, IOP Publishing, 1996.
31. **Influence of the molecular alignment on electron capture from H 2 by O 8+ projectiles.** HF Busnengo, Silvia Corchs, RD Rivarola, JH McGuire. *In Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, vol. 98, number 1, pp. 227-230, North-Holland, 1995.
32. **Uniqueness of the minimal form of Coulomb asymptotic behaviour in atomic collisions.** S. Corchs, L. Dube, J. Maidagan, R. Rivarola and A. Salin. *In J. Phys. B* 25, 2027-2036, 1992.

## Book Chapters

1. **Quality of Images.** Gianluigi Ciocca, Silvia Corchs, Francesca Gasparini, Carlo Batini, Raimondo Schettini. *Chapter in Data and Information Quality: Dimensions, Principles and Techniques*, Springer, 2015.
2. **Modeling Image Quality.** Gianluigi Ciocca, Silvia Corchs, Francesca Gasparini, Raimondo Schettini. *Chapter in Encyclopedia of Information Science and Technology*, pp. 569-580, IGI Global, 2014.
3. **Investigation of Input--Output Gain in Dynamical Systems for Neural Information Processing.** Stefano Cardanobile, Michael Cohen, Silvia Corchs, Delio Mugnolo, Heiko Neumann. *In Mathematical Analysis of Evolution, Information, and Complexity*, John Wiley & Sons, 2009.

## Conference Proceedings

1. **Detection of multimedia sexist contents,** Silvia Corchs, Elisabetta Fersini and Francesca Gasparini. *Data Science & Social Research*, 4-5 February 2019, Milan, Italy.

2. **Clustering the brain with “CluB”: A new toolbox for quantitative meta-analysis of neuroimaging data**, M. Berlinger, F. Devoto, F. Gasparini, A. Saibene, S. Corchs, L. Clemente, L. Danelli, I. Cattinelli, M. Gallucci, R. Borgoni, A. Borghese and E. Paulesu. *Annual Meeting of the Organization for Human Brain Mapping, 9-13 June 2019, Rome, Italy*.
3. **EEG Data of Face Recognition in Case of Biological Compatible Changes: a Pilot Study on Healthy People**. Aurora Saibene, Silvia Corchs, Roberta Daini, Alessio Facchin and Francesca Gasparini. *15<sup>th</sup> International Conference on Signal Processing and Multimedia Applications, 26-28 July 2018, Porto, Portugal*.
4. **Quality Assessment of JPEG-distorted Face Images: Influence of Affective Content**. Silvia Corchs, Gianluigi Ciocca and Francesca Gasparini. *15<sup>th</sup> International Conference on Signal Processing and Multimedia Applications, 26-28 July 2018, Porto, Portugal*.
5. **Multimodal classification of sexist advertisements**. Francesca Gasparini, Iaria Erba, Elisabetta Fersini and Silvia Corchs. *15<sup>th</sup> International Conference on Signal Processing and Multimedia Applications, 26-28 July 2018, Porto, Portugal*.
6. **A Multidistortion Database for Image Quality**. Corchs, Silvia and Francesca Gasparini. In *Computational Color Imaging (CCIW'17), Sixth International Workshop*, vol. 10213 of Lecture notes in Computer Science, pp. 95-104. Springer, 2017.
7. **A Complexity-Based Image Analysis to Investigate Interference between Distortions and Image Contents in Image Quality Assessment**. Ciocca, Gianluigi, Silvia Corchs, and Francesca Gasparini. In *Computational Color Imaging (CCIW'17), Sixth International Workshop*, vol. 10213 of Lecture notes in Computer Science, pp. 105-121. Springer, 2017.
8. **Does color influence image complexity perception?** Gianluigi Ciocca, Silvia Corchs, Francesca Gasparini, Emanuela Bricolo, Riccardo Tebano. In *Computational Color Imaging (CCIW'15), Fifth International Workshop*, vol. 9016 of Lecture Notes in Computer Science, pp. 139-148, Springer Berlin / Heidelberg, 2015.
9. **Complexity Perception of Texture Images**. Gianluigi Ciocca, Silvia Corchs, Francesca Gasparini. In *New Trends in Image Analysis and Processing -- ICIAP 2015 Workshops*, vol. 9281 of Lecture Notes in Computer Science, pp. 119-126, Springer International Publishing, 2015.
10. **Noisy Images-JPEG Compressed: Subjective and Objective Image Quality Evaluation**. Silvia Corchs, Francesca Gasparini, Raimondo Schettini. In *Image Quality and System Performance XI*, vol. 9016, pp. 90160-, SPIE, 2014.
11. **Video salient event classification using audio features**. Silvia Corchs, Gianluigi Ciocca, Massimiliano Fiori, Francesca Gasparini. In *Imaging and Multimedia Analytics in a Web and Mobile World 2014*, vol. 9027, pp. 90270P, SPIE, 2014.
12. **Grouping strategies to improve the correlation between subjective and objective image quality data**. Silvia Corchs, Francesca Gasparini, Raimondo Schettini. In *Image Quality and System Performance X, IS&T/SPIE Electronic Imaging*, vol. 8653, pp. 86530d(1-8), SPIE, 2013.
13. **A sharpness measure on automatically selected edge segments**. Silvia Corchs, Francesca Gasparini, Fabrizio Marini, Raimondo Schettini. In *Image Quality and System Performance IX, IS&T/SPIE Electronic Imaging*, vol. 8293, pp. 82930a(1-8), SPIE, 2012.
14. **Adaptive contrast enhancement for underexposed images**. Silvia Corchs, Francesca Gasparini, Raimondo Schettini. In *Digital Photography VII, IS&T/SPIE Electronic Imaging*, vol. 7876, SPIE, 2011.
15. **Image quality: a tool for no-reference assessment methods**. Silvia Corchs, Francesca Gasparini, Fabrizio Marini, Raimondo Schettini. In *Image Quality and System Performance VIII, IS&T/SPIE Electronic Imaging*, vol. 7867, pp. 78760x (1-9), SPIE, 2011.
16. **Enhancing underexposed images preserving the original mood**. Silvia Corchs, Francesca Gasparini. In *Third International Workshop on Computational Color Imaging*, vol. 6626 of Lecture Notes in Computer Sciences, pp. 125-136, Springer, 2011.
17. **Dynamic Range Optimization by Local Contrast Correction and Histogram Image Analysis**. Alessandro Capra, Alfio Castorina, Silvia Corchs, Francesca Gasparini, Raimondo Schettini. In *IEEE International Conference on Consumer Electronic*, pp. 309-310, IEEE, 2006.
18. **Adaptive edge enhancement using a neurodynamical model of visual attention**. Silvia Corchs, Francesca Gasparini, Raimondo Schettini. In *IEEE International Conference on Image Processing*, vol. 3, pp. 972-975, IEEE, 2005.
19. **Pixel based skin colour classification exploiting explicit skin cluster definition methods**. Silvia Corchs, Francesca Gasparini, Raimondo Schettini. In *10th Congress of the International Colour Association*, vol. 1, pp. 543-546, 2005.

20. **Video summarization using a neurodynamical model of visual attention.** Silvia Corchs, Gianluigi Ciocca, Raimondo Schettini. *In Multimedia Signal Processing, 2004 IEEE 6th Workshop on*, pp. 71-74, IEEE, 2004.
21. **The role of attention in visual perception: a computational neuroscience model**  
Gustavo Deco, Silvia Corchs. *In Compte Rendu*, pp. 13, Canadian Image Processing and Pattern Recognition Society, 2003.
22. **Electron capture of He<sup>2+</sup> ions from atomic and molecular hydrogen.** Busnengo, Corchs, Rivarola, Sant'Anna, Santos, Sigaud, Montenegro, Meyerhof, Shah and Gulyas. In *XXI International Conference on the Physics of Electronic and Atomic Collisions (ICPEAC)*, Sendai, Japan, July 1999.
23. **Study of the higher order terms of the Born series: the B1B-CDW approximation for electron capture.** S. Corchs, O. Fojon and R. Rivarola, *XXI International Conference on the Physics of Electronic and Atomic Collisions (ICPEAC)*, Sendai, Japan, July 1999.
24. **The Continuum Distorted Wave approximation for electron capture from H<sub>2</sub><sup>+</sup> targets.** H. Busnengo, S. Corchs and R. Rivarola, *XX International Conference on the Physics of Electronic and Atomic Collisions (ICPEAC)*, Vienna, Austria, July 1997
25. **Single electron capture by impact of multicharged ions on H, He and H<sub>2</sub> targets.** H.F. Busnengo, S.E. Corchs, A.E. Martinez and R.D. Rivarola, *Eighth International Conference on the Physics of highly charged ions (HCI-96)*, Japan, September 1996
26. **Total cross s for single electron capture from H<sub>2</sub> targets.** H.F. Busnengo, S.E. Corchs, J.H. McGuire and R. D. Rivarola, *XIX International Conference on the Physics of Electronic and Atomic Collisions (ICPEAC)*, Contributed Papers, 407 Canada, July 1995.
27. **Electron capture from H<sub>2</sub> targets.** S. E. Corchs, J. H. McGuire, R. D. Rivarola and Y.D. Wang, *XVIII International Conference on the Physics of Electronic and Atomic Collisions (ICPEAC)*, Contributed Papers, 685, Denmark, July 1993.
28. **Electron capture from molecular targets by ion impact.** S. Corchs, R. Rivarola and J. McGuire, *Proceedings Latin American School of Physics*, World Scientific Publishing Co., 457-465, 1991.
29. **Long range interactions in collisions between protons and H<sub>2</sub><sup>+</sup> targets.** S. Corchs, J. McGuire, R. Rivarola and Y. Wang, *XVII ICPEAC*, Contributed Papers, 530, Brisbane, July 1991.
30. **Coulomb asymptotic conditions in atomic collisions: uniqueness of a minimal form.** S. Corchs, L. Dube, J. Maidagan, R. Rivarola and A. Salin, *XVII International Conference on the Physics of Electronic and Atomic Collisions (ICPEAC)*, Brisbane, Contributed Papers, 506, July 1991.