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Education

- 2005-2010 **Ph.D.** in Computer Science, University of Maryland, College Park (Advisor: Dr. Larry S. Davis)
- 2003-2005 **M.Sc.** in Computer Science, Federal University of Parana, Brazil (Advisor: Dr. Helio Pedrini)
- 1999-2003 **B.Sc.** in Computer Science, Federal University of Parana, Brazil

Research & Professional Experience

- 2012- **Associate Professor** at the Federal University of Minas Gerais in the Computer Science Department
- 2010-2012 **Postdoctoral Researcher** at the University of Campinas in the Institute of Computing (Supervisor: Prof. Helio Pedrini)
- 2005-2010 **Research Assistant** at the University of Maryland, Department of Computer Science (Supervisor: Prof. Larry S. Davis)

Publications

Book

- 2007 | Pedrini, H. and Schwartz, W. R. (2007). *Analise de Imagens Digitais: Principios, Algoritmos e Aplicacoes*. Editora Thomson Learning. **(selected among 10 finalists for the Jabuti Award 2008, category Exact Sciences, Technology and Informatics)** (in Portuguese) 

Book Chapters

- 2014 | Schwartz, W. R. (2014). *Computer Vision: A Reference Guide*, chapter Appearance-Based Human Detection, pages 36–38. Springer US. 

- 2011 Gopalan, R., Schwartz, W. R., Chellappa, R., and Srivastava, A. (2011). *A Guide to Visual Analysis of Humans: Looking at People*, chapter Face Detection, pages 71–90. Springer. 

Journals

- 2021 Sena, J., Barreto, J., Caetano, C., Cramer, G., and Schwartz, W. R. (2021a). Human Activity Recognition based on Smartphone and Wearable Sensors Using Multiscale DCNN Ensemble. *Neurocomputing*, pages 1–9. 
- Vareto, R. and Schwartz, W. R. (2021). Face Spoofing Detection via Ensemble of Classifiers Toward Low-Power Devices. *Pattern Analysis and Applications*, pages 1–10. 
- de Lima, V. C., Melo, V. H. C., and Schwartz, W. R. (2021). Simple and Efficient Pose-based Gait Recognition Method for Challenging Environments. *Pattern Analysis and Applications*, pages 1–10. 
- Sena, J., Jordao, A., and Schwartz, W. R. (2021b). A Content-Based Late Fusion Approach Applied to Pedestrian Detection. *Journal of Visual Communication and Image Representation*, 77:91–98. 
- Laroca, R., Zanlorensi, L., Goncalves, G., Todt, E., Schwartz, W. R., and Menotti, D. (2021). An Efficient and Layout Independent Automatic License Plate Recognition System based on the YOLO Detector. *IET Intelligent Transport Systems*, 15:483–503. 
- 2020 Jordao, A., Lie, M., and Schwartz, W. R. (2020b). Discriminative Layer Pruning for Convolutional Neural Networks. *IEEE Journal of Selected Topics in Signal Processing*, 14:828–837. 
- Jordao, A., Yamada, F., and Schwartz, W. R. (2020c). Deep Network Compression based on Partial Least Squares. *Neurocomputing*, 405:234–243. 
- 2019 Prates, R. and Schwartz, W. R. (2019). Kernel Cross-view Collaborative Representation Based Classification for Person Re-identification. *Journal of Visual Communication and Image Representation*, 58:304–315. 
- Caetano, C., Melo, V. H., Bremond, F., dos Santos, J. A., and Schwartz, W. R. (2019b). Magnitude-Orientation Stream Network and Depth Information applied to Activity Recognition. *Journal of Visual Communication and Image Representation*, 63:1–12. 
- Laroca, R., Barroso, V., Diniz, M. A., Goncalves, G., Schwartz, W. R., and Menotti, D. (2019). Convolutional neural networks for automatic meter reading. *Journal of Electronic Imaging*, 28(1):1–14. 
- Nogueira, K., Mura, D. M., Chanussot, F. J., Schwartz, W. R., and dos Santos, J. (2019). Dynamic Multicontext Segmentation of Remote Sensing Images Based on Convolutional Networks. *IEEE Transactions on Geoscience and Remote Sensing*, 57(10):7503–7520. 
- 2018 da Silva Luz, E. J., Moreira, G. J. P., Oliveira, L. S., Schwartz, W. R., and Menotti, D. (2018). Learning Deep Off-the-Person Heart Biometrics Representations. *IEEE Transactions on Information Forensics and Security*, 13(5):1258–1270. 

- Jordao, A., Torres, L. A. B., and Schwartz, W. R. (2018b). Novel Approaches to Human Activity Recognition based on Accelerometer Data. *Signal, Image and Video Processing*, 12(7):1387–1394. 
- Prates, R. and Schwartz, W. R. (2018). Kernel Multiblock Partial Least Squares for a Scalable and Multicamera Person Reidentification System. *Journal of Electronic Imaging*, 27(3):1–33. 
- 2017 Colque, R. M., Caetano, C., Toledo, M., and Schwartz, W. R. (2017). Histograms of optical flow orientation and magnitude and entropy to detect anomalous events in videos. *IEEE Transactions on Circuits and Systems for Video Technology*, 27(3):673–682. 
- 2016 da S. Luz, E. J., Schwartz, W. R., Chavez, G. C., and Menotti, D. (2016). Ecg-based heart-beat classification for arrhythmia detection: A survey. *Computer Methods and Programs in Biomedicine*, 127:144–164. 
- Rodrigues, M. T. A. N., de Mesquita, D. B., Nascimento, E. R., and Schwartz, W. R. (2016). Change detection based on feature invariant to monotonic transforms and spatially constrained matching. *Journal of Electronic Imaging*, 25(1):1–10. 
- Caetano, C., Avila, S., Schwartz, W. R., Guimaraes, S. J. F., and de A. Araujo, A. (2016a). A mid-level video representation based on binary descriptors: A case study for pornography detection. *Neurocomputing*, 213:102–114. 
- dos Santos Jr., C. E., Kijak, E., Gravier, G., and Schwartz, W. R. (2016). Partial least squares for face hashing. *Neurocomputing*, 213:34–47. 
- Jr., A. C. N. and Schwartz, W. R. (2016). A scalable and flexible framework for smart video surveillance. *Computer Vision and Image Understanding*, 144(C):258–275. 
- Goncalves, G. R., da Silva, S. P. G., Menotti, D., and Schwartz, W. R. (2016a). Benchmark for license plate character segmentation. *Journal of Electronic Imaging*, 25(5):1–11. 
- 2015 Paiva, J., Schwartz, W. R., Pedrini, H., and Minghim, R. (2015). An Approach to Supporting Incremental Visual Data Classification. *IEEE Transactions on Visualization and Computer Graphics*, 21(1):4–17. 
- de Paulo Carlos, G., Pedrini, H., and Schwartz, W. R. (2015). Classification schemes based on partial least squares for face identification. *Journal of Visual Communication and Image Representation*, 32:170–179. 
- Hu, S., Choi, J., Chan, A. L., and Schwartz, W. R. (2015). Thermal-to-visible Face Recognition using Partial Least Squares. *Journal of the Optical Society of America A*, 32(3):431–442. 
- da Silva, R. D., Schwartz, W. R., Pedrini, H., Pulido, J., and Hamann, B. (2015). A Topology-Based Approach to Computing Neighborhood-of-Interest Points Using the Morse Complex. *Journal of Visual Communication and Image Representation*, 30:299–311. 
- Pinto, A., Pedrini, H., Schwartz, W. R., and A, R. (2015a). Face spoofing detection through visual codebooks of spectral temporal cubes. *IEEE Transactions on Image Processing*, 24(12):4726–4740. 

- Pinto, A., Schwartz, W. R., Pedrini, H., and Rocha, A. R. (2015b). Using Visual Rhythms for Detecting Video-Based Facial Spoof Attacks. *IEEE Transactions on Information Forensics and Security*, 10(5):1025–1038. 
- Menotti, D., Chiachia, G., Pinto, A., Schwartz, W. R., Pedrini, H., Falcao, A. X., and Rocha, A. (2015). Deep Representations for Iris, Face, and Fingerprint Spoofing Detection. *IEEE Transactions on Information Forensics and Security*, 10(4):864–879. 
- 2014 Luz, E. J., Menotti, D., and Schwartz, W. R. (2014). Evaluating the use of ECG Signal in Low Frequencies as a Biometry. *Expert Systems with Applications*, 31:2309–2315. 
- Valenzuela, R. E. G., Schwartz, W. R., and Pedrini, H. (2014). Linear Dimensionality Reduction Applied to Scale Invariant Feature Transformation and Speeded up Robust Feature Descriptors. *Journal of Electronic Imaging*, 23(3):033017. 
- 2013 Prates, R. F., Camara-Chavez, G., Schwartz, W. R., and Menotti, D. (2013). Brazilian License Plate Detection Using Histogram of Oriented Gradients and Sliding Windows. *International Journal of Computer Science and Information Technology*, 5:39–52. 
- Junior, C. S. and Schwartz, W. R. (2013). Detecção de Indivíduos não Registrados em Galerias de Faces. *Revista Eletrônica de Iniciação Científica*, 13:1–15 (in Portuguese). 
- Schwartz, W. R., de Melo, V. H. C., Pedrini, H., and Davis, L. S. (2013). A Data-Driven Detection Optimization Framework. *Neurocomputing*, 104:35–49. 
- de Siqueira, F. R., Schwartz, W. R., and Pedrini, H. (2013). Multi-Scale Gray Level Co-Occurrence Matrices for Texture Description. *Neurocomputing*, 120:336–345. 
- Jr., P. R. C., dos Santos, M. C., Schwartz, W. R., and Pedrini, H. (2013). An Improved View Frustum Culling Method using Octrees for 3D Real-Time Rendering. *International Journal of Image and Graphics*, 13(3):9–30. 
- de Lima, V., Schwartz, W. R., and Pedrini, H. (2013). 3D Searchless Fractal Video Encoding at Low Bit Rates. *Journal of Mathematical Imaging and Vision*, 45(3):239–250. 
- da Silva, R. D., Minetto, R., Schwartz, W. R., and Pedrini, H. (2013). Adaptive Edge-Preserving Image Denoising Using Wavelet Transforms. *Pattern Analysis and Applications*, 16(4):567–580. 
- 2012 Paiva, J. G., Schwartz, W. R., Pedrini, H., and Minghim, R. (2012). Semi-Supervised Dimensionality Reduction based on Partial Least Squares for Visual Analysis of High Dimensional Data. *Computer Graphics Forum*, 31(3):1345–1354. 
- Schwartz, W. R., Guo, H., Choi, J., and Davis, L. S. (2012). Face Identification Using Large Feature Sets. *IEEE Transactions on Image Processing*, 21(4):2245–2255. 
- Schwartz, W. R. and Pedrini, H. (2012). Evaluation of Feature Descriptors for Texture Classification. *Journal of Electronic Imaging*, 21(2):023016–1–023016–17. 
- 2011 Schwartz, W. R. and Pedrini, H. (2011). Improved Fractal Image Compression Based on Robust Feature Descriptors. *International Journal of Image and Graphics*, 11(4):571–587. 

- da Silva, R. D., Schwartz, W. R., Minghim, R., and Pedrini, H. (2011a). Construction of Triangle Meshes from Images at Multiple Scales. *Chilean Journal of Statistics*, 2(2):61–68. 
- da Silva, R. D., Schwartz, W. R., and Pedrini, H. (2011b). Image Segmentation Based on Wavelet Feature Descriptor and Dimensionality Reduction Applied to Remote Sensing. *Chilean Journal of Statistics*, 2(2):51–60. 
- Schwartz, W. R. (2011). Human Detection Based on Large Feature Sets Using Graphics Processing Units. *Informatica*, 35(4):473–479. 
- 2001 Pedrini, H. and Schwartz, W. R. (2001a). Detection of Topographic Characteristics in Digital Images Approximated by Triangular Surfaces. *Image Processing and Communications Journal*, 7(3-4):25–34. 

Conferences

- 2021 Jordao, A., Lie, M., de Melo, V. H. C., and Schwartz, W. R. (2020a). Covariance-free Partial Least Squares: An Incremental Dimensionality Reduction Method. In *Winter Conference on Applications of Computer Vision (WACV)*, pages 1–9. 
- Figueiredo, A., Brayan, J., Reis, R. O., Prates, R., and Schwartz, W. R. (2020). MoRe: A Large-Scale Motorcycle Re-Identification Dataset. In *Winter Conference on Applications of Computer Vision (WACV)*, pages 1–9. 
- 2020 Correia, A. J., Lie, M., and Schwartz, W. R. (2020). Stage-Wise Neural Architecture Search. In *International Conference on Pattern Recognition (ICPR)*, pages 1–8. 
- Diniz, M. A. and Schwartz, W. R. (2020). Face Attributes as Cues for Deep Face Recognition Understanding. In *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, pages 307–313. 
- Vareto, R. H., Saldanha, A. M., and Schwartz, W. R. (2020). The Swax Benchmark: Attacking Biometric Systems with Wax Figures. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 986–990. 
- Bastos, I. L. O., Melo, V. H. C., and Schwartz, W. R. (2020). BubbleNet: A Disperse Recurrent Structure To Recognize Activities. In *International Conference on Image Processing (ICIP)*, pages 2216–2220. 
- Reis, R. O., Dias, I. H., Prates, R., and Schwartz, W. R. (2020). Cycleptz: The Learning-Based Control Method For Master-Slave Camera Systems. In *International Conference on Image Processing (ICIP)*, pages 286–290. 
- Salomon, G., Brito, A., Vareto, R. H., Schwartz, W. R., and Menotti, D. (2020). Open-set Face Recognition for Small Galleries Using Siamese Networks. In *International Conference on Systems, Signals and Image Processing (IWSSIP)*, pages 161–166. 

- Colque, R., Cayllahua, E., de Melo, V. C., Chavez, G., and Schwartz, W. R. (2020). Anomaly Event Detection based on People Trajectories for Surveillance Videos. In *International Conference on Computer Vision Theory and Applications (VISAPP)*, pages 107–116. 
- 2019 Goncalves, G. R., Diniz, M. A., Laroca, R., Menotti, D., and Schwartz, W. R. (2019). Multi-Task Learning for Low-Resolution License Plate Recognition. In *Iberoamerican Congress on Pattern Recognition (CIARP)*, pages 1–10. 
- Vareto, R. H., Diniz, M. A., and Schwartz, W. R. (2019). Face Spoofing Detection on Low-Power Devices using Embeddings with Spatial and Frequency-based Descriptors. In *Iberoamerican Congress on Pattern Recognition (CIARP)*, pages 1–10. 
- de Lima, V. C. and Schwartz, W. R. (2019). Gait Recognition using Pose Estimation and Signal Processing. In *Iberoamerican Congress on Pattern Recognition (CIARP)*, pages 1–10. 
- Jordao, A., Kloss, R., Yamada, F., and Schwartz, W. R. (2019). Pruning deep networks using partial least squares. In *British Machine Vision Conference (BMVC) Workshops*, pages 1–9. 
- Bastos, I., de Melo, V. H. C., and Schwartz, W. R. (2019). Multi-Loss Recurrent Residual Networks for Gesture Detection and Recognition. In *Conference on Graphic, Patterns and Images (SIBGRAPI)*, pages 170–177. 
- Mendes, G., Paiva, J. G., and Schwartz, W. R. (2019). Point-placement techniques and Temporal Self-similarity Maps for Visual Analysis of Surveillance Videos. In *International Conference Information Visualisation (IV)*, pages 127–132. 
- Caetano, C., Bremond, F., and Schwartz, W. R. (2019a). Skeleton Image Representation for 3D Action Recognition based on Tree Structure and Reference Joints. In *Conference on Graphic, Patterns and Images (SIBGRAPI)*, pages 16–23. 
- Caetano, C., Souza, J., Bremond, F., Santos, J., and Schwartz, W. R. (2019c). SkeleMotion: A New Representation of Skeleton Joint Sequences based on Motion Information for 3D Action Recognition. In *16th International Conference on Advanced Video and Signal-based Surveillance (AVSS)*, pages 1–8. 
- 2018 Nazare, A. C., Costa, F., and Schwartz, W. R. (2018). Content-Based Multi-Camera Video Alignment using Accelerometer Data. In *Advanced Video and Signal Based Surveillance (AVSS), 2018 15th IEEE International Conference on*, pages 1–6. 
- Reis, R. O., Dias, I. H., and Schwartz, W. R. (2018). Neural Network Control for Active Cameras using Master-slave Setup. In *International Conference on Advanced Video and Signal-based Surveillance (AVSS)*, pages 1–6. 
- Bastos, I. L. O., Melo, V. H. C., Gonçalves, G. R., and Schwartz, W. R. (2018). MORA: A Generative Approach to Extract Spatiotemporal Information Applied to Gesture Recognition. In *15th International Conference on Advanced Video and Signal-based Surveillance (AVSS)*, pages 1–6. 
- Kloss, R. B., Jordao, A., and Schwartz, W. R. (2018). Face Verification: Strategies for Employing Deep Models. In *2018 13th IEEE International Conference on Automatic Face Gesture Recognition (FG 2018)*, pages 258–262. 

Sena, J., Santos, J. B., and Schwartz, W. R. (2018). Multiscale DCNN Ensemble Applied to Human Activity Recognition Based on Wearable Sensors. In *26th European Signal Processing Conference (EUSIPCO)*, pages 1202–1206. 

Sales, A. L. C., Vareto, R. H., Schwartz, W. R., and Chavez, G. C. (2018). Single-Shot Person Re-Identification Combining Similarity Metrics and Support Vectors. In *Conference on Graphic, Patterns and Images (SIBGRAPI)*, pages 250–257. 

de Melo, V. H. C., Santos, J. B., Caetano, C., Sena, J., Penatti, O. A. B., and Schwartz, W. R. (2018). Object-based Temporal Segment Relational Network for Activity Recognition. In *Conference on Graphic, Patterns and Images (SIBGRAPI)*, pages 103–109. 

Gonçalves, G. R., Diniz, M. A., Laroca, R., Menotti, D., and Schwartz, W. R. (2018). Real-time Automatic License Plate Recognition Through Deep Multi-Task Networks. In *Conference on Graphic, Patterns and Images (SIBGRAPI)*, pages 110–117. 

Laroca, R., Severo, E., Zanlorensi, L. A., Oliveira, L. S., Gonçalves, G. R., Schwartz, W. R., and Menotti, D. (2018). A Robust Real-Time Automatic License Plate Recognition Based on the YOLO Detector. In *2018 International Joint Conference on Neural Networks (IJCNN)*, pages 1–10. 

Caetano, C., dos Santos, J. A., and Schwartz, W. R. (2018). Statistical Measures from Co-occurrence of Codewords for Action Recognition. In *13th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISAPP)*, pages 301–308. 

Colque, R. M., Caetano, C., de Melo, V. C., Chavez, G. C., and Schwartz, W. R. (2018). Novel Anomalous Event Detection based on Human-object Interactions. In *13th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISAPP)*, pages 293–300. 

Jordao, A., Kloss, R., and Schwartz, W. R. (2018a). Latent HyperNet: Exploring the Layers of Convolutional Neural Networks. In *2018 International Joint Conference on Neural Networks (IJCNN)*, pages 1–7. 

Ferreira, G. S., Padua, F. L. C., Schwartz, W. R., and Rodrigues, M. T. A. N. (2018). Mapping Sports Interest with Social Network. In *XV Encontro Nacional de Inteligencia Artificial e Computacional (ENIAC)*, pages 1–12. 

2017 Vareto, R., Silva, S., Costa, F., and Schwartz, W. R. (2017a). Towards Open-Set Face Recognition using Hashing Functions. In *IEEE International Joint Conference on Biometrics (IJCB)*, pages 634–641. IAPR/IEEE Best Paper Runner-up Award. **(IAPR/IEEE Best Paper Runner-up Award)** 

Caetano, C., de Melo, V. H. C., dos Santos, J. A., and Schwartz, W. R. (2017). Activity Recognition based on a Magnitude-Orientation Stream Network. In *Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 47–54. Best Computer Vision/Image Processing/Pattern Recognition Main Track Paper Award. **(Best Computer Vision/Image Processing/Pattern Recognition Main Track Paper Award)** 

2016

- Vareto, R. H., da Silva, S. S., de Oliveira Costa, F., and Schwartz, W. R. (2017b). Face Verification based on Relational Disparity Features and Partial Least Squares Models. In *Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 209–215. 
- Bastos, I. L. O. and Schwartz, W. R. (2017). Assigning Relative Importance to Scene Elements. In *Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 413–420. 
- Santos, A. B., d. A. Araujo, A., dos Santos, J. A., Schwartz, W. R., and Menotti, D. (2017). Combination techniques for hyperspectral image interpretation. In *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, pages 3648–3651. 
- de Lima, V., Moreira¹, T. P., Pedrini¹, H., and Schwartz, W. R. (2017). Fast Scalable Coding Based on a 3D Low Bit Rate Fractal Video Encoder. In *12th International Conference on Computer Vision Theory and Applications (VISAPP)*, pages 24–33. 
- Bastos, I. L. O., Soares, L. R., and Schwartz, W. R. (2017). Pyramidal Zernike Over Time: A spatiotemporal feature descriptor based on Zernike Moments. In *Iberoamerican Congress on Pattern Recognition (CIARP 2017)*, pages 77–85. 
- Peixoto, S., Goncalves, G., Bianchi, A., Brito, A. D. S., Schwartz, W. R., and Menotti, D. (2017). Noisy Character Recognition using Deep Convolutional Neural Networks. In *Iberoamerican Congress on Pattern Recognition (CIARP 2017)*, pages 499–507. 
- Kloss, R. B., Jordao, A., and Schwartz, W. R. (2017). Boosted Projection: An Ensemble of Transformation Models. In *22nd Iberoamerican Congress on Pattern Recognition (CIARP)*, pages 331–338. 
- Prates, R., Oliveira, M., and Schwartz, W. R. (2016). Kernel Partial Least Squares for Person Re-Identification. In *13th International Conference on Advanced Video and Signal-Based Surveillance (AVSS)*, pages 249–255. 
- de C. Prates, R. F., Dutra, C. R. S., and Schwartz, W. R. (2016). Predominant Color Name Indexing Structure for Person Re-Identification. In *IEEE International Conference on Image Processing (ICIP)*, pages 779–783. 
- Correia, A. J. L. and Schwartz, W. R. (2016). Oblique Random Forest based on Partial Least Squares Applied to Pedestrian Detection. In *IEEE International Conference on Image Processing (ICIP)*, pages 2931–2935. 
- Correia, A. J. L., de Souza Sena, J., and Schwartz, W. R. (2016). A Late Fusion Approach to Combine Multiple Pedestrian Detectors. In *23rd International Conference on Pattern Recognition (ICPR)*, pages 4250–4255. 
- Caetano, C., dos Santos, J. A., and Schwartz, W. R. (2016b). Optical Flow Co-occurrence Matrices: A Novel Spatiotemporal Feature Descriptor. In *23rd International Conference on Pattern Recognition (ICPR)*, pages 1947–1952. 
- Nogueira, K., Mura, M. D., Chanussot, J., Schwartz, W. R., and dos Santos, J. A. (2016). Learning to Semantically Segment High-Resolution Remote Sensing Images. In *23rd International Conference on Pattern Recognition (ICPR)*, pages 3566–3571. 

2015

Prates, R. F. and Schwartz, W. R. (2016). Kernel Hierarchical PCA for Person Re-Identification. In *23rd International Conference on Pattern Recognition (ICPR)*, pages 2091–2096. 

Goncalves, G. R., Menotti, D., and Schwartz, W. R. (2016b). License Plate Recognition based on Temporal Redundancy. In *IEEE International Conference on Intelligent Transportation Systems (ITSC)*, pages 2577–2582. 

Vareto, R. H., Costa, F., and Schwartz, W. R. (2016). Face identification in large galleries. In *Workshop on Face Processing Applications*, pages 1–4. 

Jr., C. E. S., Kijak, E., Gravier, G., and Schwartz, W. R. (2015b). Learning to hash faces using large feature vectors. In *Content-Based Multimedia Indexing (CBMI), 13th International Workshop on*, pages 1–6. 

Kloss, R. B., Silva, S., Cirne, M. V. M., Pedrini, H., and Schwartz, W. R. (2015). Partial least squares image clustering. In *Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 41–48. 

Colque, R. V. H. M., Caetano, C., and Schwartz, W. R. (2015). Histograms of optical flow orientation and magnitude to detect anomalous events in videos. In *Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 126–133. 

Nogueira, K., Schwartz, W. R., and dos Santos, J. A. (2015). Coffee Crop Recognition Using Multi-scale Convolution Neural Networks. In *14th Iberoamerican Congress on Pattern Recognition (CIARP)*, pages 67–74. 

dos Santos, C. E., Gravier, G., and Schwartz, W. R. (2015). Ssig and irisa at multimodal person discovery. In *Working Notes Proceedings of the MediaEval 2015 Workshop*, pages 1–3. 

Pessoa, R. F., Schwartz, W. R., and dos Santos, J. A. (2015). A Study on Low-Cost Representations for Image Feature Extraction on Mobile Devices. In *14th Iberoamerican Congress on Pattern Recognition (CIARP)*, pages 424–431. 

Peixoto, S., Gonçalves, G. R., Camara-Chavez, G., Schwartz, W. R., and Gomes, D. M. (2015). Brazilian License Plate Character Recognition using Deep Learning. In *Workshop em Visao Computacional (WVC)*, pages 1–5. 

Correia, A. J. L., de Melo, V. H. C., and Schwartz, W. R. (2015). A Study of Filtering Approaches for Sliding Window Pedestrian Detection. In *Workshop em Visao Computacional (WVC)*, pages 1–8. 

Rodrigues, M. T. A., Balbino, D., Nascimento, E. R., and Schwartz, W. R. (2015). A Non-Parametric Approach to Detect Changes in Aerial Images. In *14th Iberoamerican Congress on Pattern Recognition (CIARP)*, pages 116–124. 

de C. Prates, R. F. and Schwartz, W. R. (2015b). CBRA: Color-Based Ranking Aggregation for Person Re-Identification. In *IEEE International Conference on Image Processing (ICIP)*, pages 1975–1979. 

2014

Santos, A. B., Araujo, A. A., Schwartz, W. R., and Menotti, D. (2015). Hyperspectral Image Interpretation based on Partial Least Squares. In *IEEE International Conference on Image Processing (ICIP)*, pages 1885–1889. 

de C. Prates, R. F. and Schwartz, W. R. (2015a). Appearance-Based Person Re-identification by Intra-Camera Discriminative Models and Rank Aggregation. In *2015 International Conference on Biometrics (ICB)*, pages 65–72. 

Prado, G. L., Schwartz, W. R., and Pedrini, H. (2015). A Verify-Correct Approach to Person Re-identification Based on Partial Least Squares Signatures. In *2015 International Conference on Biometrics (ICB)*, pages 222–228. 

Schwartz, W. R., de Rezende, P. J., and Pedrini, H. (2015). Faster Approximations of Shortest Geodesic Paths on Polyhedra Through Adaptive Priority Queue. In *10th International Conference on Computer Vision Theory and Applications (VISAPP)*, pages 371–378. 

Jr., A. C. N., Rodrigues, M. T., Melo, V. H., Correia, A. J. L., Goncalves, G. R., Nogueira, K., Caetano, C. A., Jr., E. F., dos Santos, J. A., and Schwartz, W. R. (2015a). A computational infrastructure model for research on computer vision. In *Brazilian e-Science Workshop*, pages 1–6. 

de Melo, V. H. C., Leao, S., Menotti, D., and Schwartz, W. R. (2014). An Optimized Sliding Window Approach to Pedestrian Detection. In *IAPR International Conference on Pattern Recognition (ICPR)*, pages 4346–4351. 

Jr., A. C. N., dos Santos, C. E., Ferreira, R., and Schwartz, W. R. (2014a). Smart Surveillance Framework: A Versatile Tool for Video Analysis. In *IEEE Winter Conference on Applications of Computer Vision (WACV)*, pages 753–760. 

Jr., A. C. N., Ferreira, R., and Schwartz, W. R. (2014b). Scalable Feature Extraction for Visual Surveillance. In *Iberoamerican Congress on Pattern Recognition (CIARP)*, volume 8827 of *Lecture Notes in Computer Science*, pages 375–382. Springer International Publishing. 

Rodrigues, M., Milen, L., Nascimento, E., and Robson Schwartz, W. (2014). Change Detection based on Features Invariant to Monotonic Transforms and Spatial Constrained Matching. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 4334–4338. 

dos Santos Jr., C. E. and Schwartz, W. R. (2014). Extending Face Identification to Open-Set Face Recognition. In *Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 188–195. 

Mora-Colque, R. V., Camara-Chavez, G., and Schwartz, W. R. (2014). Detection of Groups of People in Surveillance Videos Based on Spatio-Temporal Clues. In *Iberoamerican Congress on Pattern Recognition (CIARP)*, volume 8827 of *Lecture Notes in Computer Science*, pages 948–955. Springer International Publishing. 

Dutra, C. R. S., Rocha, M. C., and Schwartz, W. R. (2014). Person Re-Identification Based on Weighted Indexing Structures. In *Iberoamerican Congress on Pattern Recognition (CIARP)*, volume 8827 of *Lecture Notes in Computer Science*, pages 359–366. Springer International Publishing. 

- Prates, R. C., Camara-Chavez, G., Schwartz, W. R., and Menotti, D. (2014). An Adaptive Vehicle License Plate Detection at Higher Matching Degree. In *Iberoamerican Congress on Pattern Recognition (CIARP)*, volume 8827 of *Lecture Notes in Computer Science*, pages 454–461. Springer International Publishing. 
- Silva, S., Schwartz, W. R., and Camara-Chavez, G. (2014). Spatial Pyramid Matching for Finger Spelling Recognition in Intensity Images. In *Iberoamerican Congress on Pattern Recognition (CIARP)*, volume 8827 of *Lecture Notes in Computer Science*, pages 629–636. Springer International Publishing. 
- Souza, J. S., Ferreira, C. A. M., Santos Junior, C., Melo, V. H. C., and Schwartz, W. R. (2014). Self-Organizing Traffic Lights: A Pedestrian Oriented Approach. In *Workshop de Visao Computacional (WVC)*, pages 1–6. 
- 2013 de Melo, V. H. C., Leao, S., Campos, M., Menotti, D., and Schwartz, W. R. (2013). Fast Pedestrian Detection based on a Partial Least Squares Cascade. In *IEEE International Conference on Image Processing (ICIP)*, pages 4146–4150. 
- de Paulo Carlos, G., Pedrini, H., and Schwartz, W. R. (2013). Fast and Scalable Enrollment for Face Identification based on Partial Least Squares. In *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, pages 1–8. 
- Dutra, C. R. S., Souza, T., Alves, R., Oliveira, L., and Schwartz, W. R. (2013). Re-identifying People based on Indexing Structure and Manifold Appearance Modeling. In *Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 218–225. 
- Chingovska, I., Yang, J., Lei, Z., Yi, D., Kahm, O., Glaser, C., Damer, N., Kuijper, A., Nouak, A., Komulainen, J., and S. Gupta, T. P., Khandelwal, S., Bansal, S., Rai, A., Krishna, T., Goyal, D., Waris, M. A., Zhang, H., Ahmad, I., Kiranyaz, S., and R. Tronci, M. G., Pili, M., Sirena, N., Roli, F., Galbally, J., Fierrez, J., Pinto, A., Pedrini, H., Schwartz, W. R., Rocha, A., Anjos, A., and Marcel, S. R. (2013). The 2nd Competition on Counter Measures to 2D Face Spoofing Attacks. In *International Conference on Biometrics*, pages 1–6. 
- Buzin, R. K. and Schwartz, W. R. (2013). Action Recognition Applied to Monitor Domestic Animals. In *IX Workshop de Visao Computacional*, pages 1–6. 
- Siqueira, F. R., Schwartz, W. R., and Pedrini, H. (2013). Adaptive Detection of Human Skin in Color Images. In *IX Workshop de Visao Computacional*, pages 1–6. 
- Estrela, B., Camara-Chavez, G., Campos, M. F. M., Schwartz, W. R., and Nascimento, E. R. (2013). Sign Language Recognition using Partial Least Squares and RGB-D Information. In *IX Workshop de Visao Computacional*, pages 1–6. 
- Melo, V. H. C., Leao, S., and Schwartz, W. R. (2013). Pedestrian Detection Optimization Based on Random Filtering. In *Workshop of Woks in Progress (WIP) in SIBGRAPI - Conference on Graphics, Patterns and Images*, pages 1–4. 
- Correa, T., Campos, M. F. M., Schwartz, W. R., and Nascimento, E. R. (2013). Indirect Eye Gaze Estimation based on Depth Information. In *Workshop of Woks in Progress (WIP) in SIBGRAPI - Conference on Graphics, Patterns and Images*, pages 1–4. 

2012

G, V. R. E., Schwartz, W. R., and Pedrini, H. (2013). Dimensionality Reduction Through LDA and Bag-of-Features Applied to Image Retrieval. In *International Conference VIPImage - IV ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing*, pages 1–6. 

Chiachia, G., Pinto, N., Schwartz, W. R., Rocha, A., Falcao, A. X., and Cox, D. (2012). Person-Specific Subspace Analysis for Unconstrained Familiar Face Identification. In *Proceedings of the British Machine Vision Conference*, pages 101.1–101.12. 

da Silva, R. D., Schwartz, W. R., and Pedrini, H. (2012). Scalar Image Interest Point Detection and Description Based on Discrete Morse Theory and Geometric Descriptors. In *19th IEEE International Conference on Image Processing (ICIP)*, pages 1877–1880. 

Nascimento, E. R., Schwartz, W. R., and Campos, M. F. M. (2012b). EDVD - Enhanced Descriptor for Visual and Depth Data. In *IAPR International Conference on Pattern Recognition*, pages 2776–2779. 

Nascimento, E. R., Oliveira, G. L., Campos, M. F. M., and A. W. Vieira, W. R. S. (2012a). BRAND: A Robust Appearance and Depth Descriptor for RGB-D Images. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1720–1726. 

Vieira, A. W., Schwartz, W. R., Campos, M. F. M., and Lewiner, T. (2012). Distance Matrices as Invariant Features for Classifying MoCap Data. In *IAPR International Conference on Pattern Recognition*, pages 2934–2937. 

Schwartz, W. R. (2012). Scalable People Re-Identification Based on a One-Against-Some Classification Scheme. In *19th IEEE International Conference on Image Processing (ICIP)*, pages 1613–1616. 

Pinto, A. S., Pedrini, H., Schwartz, W. R., and Rocha, A. (2012). Video-Based Face Spoofing Detection through Visual Rhythm Analysis. In *25th SIBGRAPI Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 221–228. 

Nascimento, E. R., Schwartz, W. R., Oliveira, G. L., Vieira, A. W., Campos, M. F. M., and Mesquita, D. B. (2012c). Appearance and Geometry Fusion for Enhanced Dense 3D Alignment. In *25th SIBGRAPI Conference on Graphics, Patterns and Images (SIBGRAPI)*, pages 47–54. 

Valenzuela, R. E. G., Schwartz, W. R., and Pedrini, H. (2012). Dimensionality Reduction Through PCA over SIFT and SURF Descriptors. In *Conference on Cybernetics Intelligent Systems*, pages 1–6. 

Choi, J., Guo, H., Schwartz, W. R., and Davis, L. S. (2012). A Complementary Local Feature Descriptor for Face Identification. In *IEEE Workshop on Applications of Computer Vision*, pages 121–128. 

Rézio, A. C., Schwartz, W. R., and Pedrini, H. (2012). Image Sequence Super-Resolution Based on Learning Using Feature Descriptors. In *International Conference on Computer Vision Theory and Application*, pages 135–144. 

- 2011 Schwartz, W. R., da Silva, R. D., Davis, L. S., and Pedrini, H. (2011a). A Novel Feature Descriptor Based on the Shearlet Transform. In *IEEE International Conference on Image Processing*, pages 1033–1036. 
- Schwartz, W. R., Davis, L. S., and Pedrini, H. (2011b). Local Response Context Applied to Pedestrian Detection. In *Iberoamerican Congress on Pattern Recognition*, pages 181–188. 
- Schwartz, W. R., Rocha, A., and Pedrini, H. (2011c). Face Spoofing Detection through Partial Least Squares and Low-Level Descriptors. In *International Joint Conference on Biometrics (IJCB)*, pages 1–8. 
- Guo, H., Schwartz, W. R., and Davis, L. S. (2011). Face Verification using Large Feature Sets and One Shot Similarity. In *International Joint Conference on Biometrics (IJCB)*, pages 1–8. 
- Chakka, M., Anjos, A., Marcel, S., Tronci, R., Muntoni, D., Fadda, G., Pili, M., Sirena, N., Murgia, G., Ristori, M., Roli, F., Yan, J., Yi, D., Lei, Z., Zhang, Z., Li, S., Schwartz, W., Rocha, A., Pedrini, H., Lorenzo-Navarro, J., Castrillon-Santana, M., Maatta, J., Hadid, A., and Pietikainen, M. (2011). Competition on Counter Measures to 2D Facial Spoofing Attacks. In *International Joint Conference on Biometrics (IJCB)*, pages 1–6. 
- de Lima, V., Schwartz, W. R., and Pedrini, H. (2011a). Fast Low Bit-Rate 3D Searchless Fractal Video Encoding. In *Conference on Graphics, Patterns and Images*, pages 189–196. 
- de Lima, V., Schwartz, W. R., and Pedrini, H. (2011b). Fractal Image Encoding Using a Constant Size Domain Pool. In *Workshop de Visao Computacional*, pages 137–142. 
- 2010 Gopalan, R. and Schwartz, W. R. (2010). Detecting Humans under Partial Occlusions using Markov Logic Networks. In *10th Performance Metrics for Intelligent Systems Workshop*, pages 182–186. 
- Schwartz, W. R., Guo, H., and Davis, L. S. (2010). A Robust and Scalable Approach to Face Identification. In *European Conference on Computer Vision*, volume 6316 of *Lecture Notes in Computer Science*, pages 476–489. 
- 2009 Schwartz, W. R., Kembhavi, A., Harwood, D., and Davis, L. S. (2009b). Human Detection Using Partial Least Squares Analysis. In *IEEE International Conference on Computer Vision*, pages 24–31. **(oral presentation)** 
- Schwartz, W. R. and Davis, L. S. (2009). Learning Discriminative Appearance-Based Models Using Partial Least Squares. In *XXII Brazilian Symposium on Computer Graphics and Image Processing (SIBGRAPI)*, pages 322–329. 
- Schwartz, W. R., Gopalan, R., Chellappa, R., and Davis, L. S. (2009a). Robust Human Detection under Occlusion by Integrating Face and Person Detectors. In *International Conference on Biometrics*, volume 5558 of *Lecture Notes in Computer Science*, pages 970–979. 
- Schwartz, W. R., Pedrini, H., and Davis, L. S. (2009c). Video Compression and Retrieval of Moving Object Location Applied to Surveillance. In *International Conference on Image Analysis and Recognition*, volume 5627 of *Lecture Notes in Computer Science*, pages 906–916. 

- 2008 Kembhavi, A., Schwartz, W. R., and Davis, L. S. (2008). Resource Allocation for Tracking Multiple Targets Using Particle Filters. In *IEEE International Workshop on Visual Surveillance*, pages 1–8. 
- da Silva, R. S., Minetto, R., Schwartz, W. R., and Pedrini, H. (2008). Satellite Image Segmentation Using Wavelet Transforms Based on Color and Texture Features. In *International Symposium on Advances in Visual Computing*, volume 5359 of *Lecture Notes in Computer Science*, pages 113–122. 
- 2007 Schwartz, W. R. and Pedrini, H. (2007). Color Textured Image Segmentation Based on Spatial Dependence Using 3D Co-occurrence Matrices and Markov Random Fields. In *International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision*, pages 81–87. 
- 2006 Schwartz, W. R. and Pedrini, H. (2006). Textured Image Segmentation Based on Spatial Dependence using a Markov Random Field Model. In *IEEE International Conference on Image Processing*, pages 2449–2452. 
- Schwartz, W. R., da Silva, R. D., Minetto, R., and Pedrini, H. (2006). An Improved K-means Clustering Algorithm for Image Segmentation. In *Workshop de Visao Computacional*, pages 1–6. 
- 2005 Schwartz, W. R. and Pedrini, H. (2005b). Segmentação de Imagens de Terrenos Baseada na Associação de Características de Texturas com Dependência Espacial Modelada por Campo Aleatório de Markov. In *Simpósio Brasileiro de Sensoriamento Remoto*, pages 4311–4318 (in Portuguese). 
- Minetto, R., Silva, R. D., Schwartz, W. R., and Pedrini, H. (2005). Segmentação de Imagens Utilizando Abordagem Espectral por Transformadas Wavelet e de Fourier. In *Colóquio Brasileiro de Ciências Geodésicas*, pages 1–6 (in Portuguese). 
- Schwartz, W. R. and Pedrini, H. (2005a). Avaliação de Métodos de Análise de Texturas Aplicadas em Imagens Digitais de Terrenos. In *Colóquio Brasileiro de Ciências Geodésicas*, pages 1–6 (in Portuguese). 
- 2004 Schwartz, W. R. and Pedrini, H. (2004). Texture Classification Based on Spatial Dependence Features Using Co-Occurrence Matrices and Markov Random Fields. In *IEEE International Conference on Image Processing*, pages 239–242. 
- 2003 Schwartz, W. R. and Pedrini, H. (2003a). Aspectos Teóricos das Transformadas de Imagens. In *Workshop de Trabalhos de Iniciação Científica em Computação Gráfica e Processamento de Imagens*, pages 26–33 (in Portuguese). 
- Schwartz, W. R. and Pedrini, H. (2003b). Método para Classificação de Imagens Baseada em Matrizes de Co-ocorrência Utilizando Características de Textura. In *Colóquio Brasileiro de Ciências Geodésicas*, pages 1–11 (in Portuguese). 
- Schwartz, W. R., van Kaick, O. M., da Silva, M. V. G., and Pedrini, H. (2003). Reconhecimento em Tempo Real de Agentes Autônomos em Futebol de Robôs. In *Simpósio Brasileiro de Automação Inteligente*, pages 94–99 (in Portuguese). 

- 2002 van Kaick, O. M., da Silva, M. V. G., Schwartz, W. R., and Pedrini, H. (2002). Fitting Smooth Surfaces to Scattered 3D Data Using Piecewise Quadratic Approximation. In *IEEE International Conference on Image Processing*, volume 1, pages 493–496. 
- 2001 Pedrini, H., Schwartz, W. R., and Franklin, W. R. (2001). Automatic Extraction of Topographic Features Using Adaptive Triangular Meshes. In *IEEE International Conference on Image Processing*, pages 732–735. 
- Pedrini, H. and Schwartz, W. R. (2001b). Topographic Feature Identification Based on Triangular Meshes. In *International Conference on Computer Analysis of Images and Patterns*, volume 2124 of *Lecture Notes in Computer Science*, pages 621–629. 
- van Kaick, O. M., Schwartz, W. R., da Silva, M. V. G., and Pedrini, H. (2001). Identificação e Rastreamento em Tempo Real de Múltiplos Agentes Autônomos. In *Seminário de Informática*, pages 59–70 (in Portuguese). 

Patents

- 2020 **US 16/849,350** - Method for Video Recognition Capable of Encoding Spatial and Temporal Relationships of Concepts using Contextual Features (pending).
- 2019 **BR 10.2019.024569-7** - Metodo de Reconhecimento de Video Capaz de Codificar Relacoes Temporais e Espaciais de Conceitos utilizando Informacoes Contextuais (pending). (in Portuguese)
- 2018 **US 16/033,847** - Method and system for sensor data recognition using data enrichment for the learning process (pending).
- BR 10.2017.026251-0** - Metodo e Sistema de Reconhecimento de dados de sensor utilizando o enriquecimento de dados para o processo de aprendizagem (pending). (in Portuguese)

Research Grants (Principal Investigator)

- 2019-2021 **Making Sense: Robust Approaches for Video Monitoring** - project sponsored by the Brazilian Research Agency (CNPq). This project mainly focus on developing and improving techniques for environment monitoring through visual data obtained from a surveillance cameras network.
- 2019 **HitSense: Sensor Analytics Solutions** - project developed in partnership with Maxtrack Inovation Company. This project aims at the development of algorithms based on embedded sensor data processing to predict and analyze vehicle collisions.

2018-2019	Store Monitoring - project developed in partnership with Localiza Rent a Car S/A (the largest car rental company in Brazil). This project aims at the improvement of client experience while renting a car by analyzing waiting time using visual data.
2018-2021	SMS: Surveillance Systems and Algorithms for Oil Extraction Platforms - project developed in partnership with the Petroleo Brasileiro S/A (Brazilian oil company). This project aims at the development of smart surveillance algorithms to monitor workers in oil extraction platforms.
2017-2019	ECV2: Knowledge Extraction on Visual Surveillance - project sponsored by the Minas Gerais Research Agency (FAPEMIG) within the Minas Gerais State Researcher Program (PPM-XI).
2017-2019	Video Analytics Solutions - project developed in partnership with Maxtrack Inovation Company. This project aims at the development of algorithms based on computer vision and machine learning for video analytics considering Internet of Things (IoT) scenarios.
2016-2018	HAR - Human Activity Recognition - project developed in partnership with Samsung. This project focuses on the development of algorithms able to recognize human activities based on visual and sensor information.
2016-2016	Keymaker - Human Activity Recognition based on Contextual Information project developed in partnership with Hewlett-Packard. This project aims the development of new algorithms for activity recognition considering contextual information extracted from the environment.
2015-2019	GigaFrames: Large Scale Approaches to Surveillance and Computer Forensics - project sponsored by the Minas Gerais Research Agency (FAPEMIG). The goal of this project is the development of Computer Vision and Machine Learning techniques to monitor environments and analyze forensics data when vast amounts of data are captured through surveillance cameras.
2015-2017	VER+: Robust and Efficient Methods for Surveillance - project sponsored by the Minas Gerais Research Agency (FAPEMIG) within the Minas Gerais State Researcher Program (PPM-IX).
2014-2020	DeepEyes: Visual Computing and Machine Learning Solutions for Computer Forensics and Electronic Surveillance - project sponsored by the Brazilian Coordination for the Improvement of Higher Education Personnel (CAPES). This project aims at the development of visual computing and machine learning algorithms related to the computer forensics and surveillance.
2013-2015	SmartView: Automatic Monitoring in Sport Competitions - project sponsored by the Brazilian Research Agency (CNPq) and the Brazilian Ministry of Sports. This project's goal is help monitoring, and consequently, improve the safety of sports venues for sports fans.
2013-2016	VER+: Robust and Efficient Methods for Surveillance - project sponsored by the Brazilian Research Agency (CNPq). This project mainly focus on developing and improving techniques for environment monitoring through visual data obtained from a surveillance cameras network.

2013-2016	DET: Efficient Pedestrian Detection Applied to Looking at People - project sponsored by the Minas Gerais Research Agency (FAPEMIG). This project's goal is to propose methods for pedestrian detection with reduced computing cost but without trading off accuracy.
2012-2015	ARDOP: Discriminative and Robust Approaches to Looking at People - project sponsored by the Minas Gerais Research Agency (FAPEMIG). This project aims at solving problems related to people observation, focusing in robust and discriminative approaches to reduce inaccurate results so that high level problems can be solved.

Total in research grants: R\$ 8,105,036.65

Fellowships

2020-2024	Productivity Fellowship (level 1D) sponsored by the Brazilian National Research Council (CNPq)
2017-2023	Minas Gerais State Researcher sponsored by the the Minas Gerais Research Agency (FAPEMIG)
2017-2020	Productivity Fellowship (level 2) sponsored by the Brazilian National Research Council (CNPq)
2015-2017	Minas Gerais State Researcher sponsored by the the Minas Gerais Research Agency (FAPEMIG)
2014-2017	Productivity Fellowship (level 2) sponsored by the Brazilian National Research Council (CNPq)
2005-2009	Fulbright PhD. Fellowship at the University of Maryland, Department of Computer Science (Advisor: Prof. Larry S. Davis)
2005	CNPq Technical Fellowship at the Federal University of Parana, Department of Computer Science (Supervisor: Prof. Helio Pedrini)
2003-2005	CNPq MSc. Fellowship at the Federal University of Parana, Department of Computer Science (Advisor: Prof. Helio Pedrini)
2000-2002	CAPES Special Training Program Fellowship at the Federal University of Parana, Department of Computer Science

Keynote Speaker

2020	<i>Scene Monitoring using Active Cameras.</i> IEEE International Conference on Automatic Face and Gesture Recognition.
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2018	<i>Challenges of Computer Vision in Video Surveillance and Biometrics.</i> BRAGFOST 2018: The Brazilian-German Frontiers of Science and Technology Symposia. <i>Person identification in Surveillance Scenarios.</i> Brazilian Workshop on Computer Vision.
2017	<i>Computer Vision Applied to Smart Surveillance and Biometrics.</i> Colloquium 2017 - IBM Research. <i>Smart Surveillance: Data Representation and Scalability Issues.</i> Peruvian Symposium on Graphics and Images.
2014	<i>Smart Surveillance at Large Scale.</i> Brazilian Workshop on Computer Vision.

Selected Awards and Honors

2021	Advisor of work <i>Partial Least Squares: A Deep Space Odyssey</i> . Honorable Mention in the Great PhD Dissertation Prize at Federal University of Minas Gerais.
2018	Advisor of work <i>Face Recognition Based on a Collection of Binary Classifiers</i> . Best Thesis on the Workshop of Thesis and Dissertation in SIBGRAPI - 31st Conference on Graphics, Patterns and Images.
2017	IAPR/IEEE Best Paper Runner-up Award with paper <i>Towards Open-Set Face Recognition using Hashing Functions</i> . International Joint Conference on Biometrics. Best Computer Vision/Image Processing/Pattern Recognition Main Track Paper Award with paper <i>Activity Recognition Based on a Magnitude-Orientation Stream Network</i> , SIBGRAPI 2017 - 30th Conference on Graphics, Patterns and Images.

Students

Postdoctoral Supervision

Carlos Antonio Caetano Junior, 2020-2021
 Raphael Felipe de Carvalho Prates, 2020
 Filipe de Oliveira Costa, 2018-2019

Doctoral Degree

Artur Jordao Lima Correia, 2020
 Igor Leonardo Oliveira Bastos, 2020
 Carlos Antonio Caetano Junior, 2019
 Raphael Felipe de Carvalho Prates, 2019
 Rensso Victor Hugo Mora Colque, 2018
 Marco Tulio Alves Rodrigues, 2016

Master's Degree

Matheus Alvez Diniz, 2021
Vitor Cezar de Lima, 2021
Jessica Sena de Souza, 2018
Ricardo Barbosa Kloss, 2018
Samira Santos da Silva, 2018
Rafael Henrique Vareto, 2017
Artur Jordao de Lima Correia, 2016
Cristianne Rodrigues Santos Dutra, 2016
Gabriel Resende Goncalves, 2016 (Samsung Research)
Cassio Elias do Santos Junior, 2015
Antonio Carlos Nazare Junior, 2014
Victor Hugo Cunha de Melo, 2014

Professional Activities**Professional and Academic Membership**

Member of the IEEE, IEEE Computer Society, IEEE Signal Processing Society, and Brazilian Computer Science Society

Academic Service

Program Chair, SIBGRAPI 2016
Program Chair, Brazilian Workshop on Computer Forensics 2014
Program Chair, Workshop on Theses and Dissertations 2014
Tutorial Chair, IEEE ICB 2019
Publicity Chair, IEEE IJCB 2017

Conference/Workshop Reviewing

Area Chair, IEEE WACV 2018, 2021
Area Chair, IEEE FG 2021
Reviewer, IEEE CVPR 2016, 2017, 2019, 2020, 2021
Reviewer, IEEE ICCV 2015, 2017
Reviewer, IEEE ECCV 2016, 2018, 2020
Reviewer, IEEE AVSS 2017, 2021
Reviewer, IEEE FG 2015, 2017
Reviewer, IEEE ICASSP 2015-2017
Reviewer, IEEE ICIP 2013-2018
Reviewer, IEEE WACV 2017
Reviewer, IAPR ICB 2016, 2018
Reviewer, IJCB 2017
Reviewer, IROS 2016
Reviewer, ISBA 2017, 2018
Reviewer, SIBGRAPI 2013, 2014, 2015, 2017, 2018, 2020, 2021
Program Committee, ACCV 2012, 2014, 2016, 2020
Program Committee, IEEE FG 2013, 2018

Program Committee, IEEE BTAS 2015, 2016

Program Committee, Iberoamerican Congress on Pattern Recognition (CIARP) 2016, 2017, 2018

Program Committee, Brazilian Workshop on Computer Vision (WVC) 2013-2021

Journal Reviewing

Reviewer, IEEE Transactions on Information Forensics and Security

Reviewer, IEEE Transactions on Image Processing

Reviewer, IEEE Signal Processing Letters

Reviewer, IEEE Transactions on Circuits and Systems for Video Technology

Reviewer, Computer Vision and Image Understanding

Reviewer, Journal of Mathematical Imaging and Vision

Reviewer, Elsevier Pattern Recognition Letters

Reviewer, Elsevier Pattern Recognition

Reviewer, Elsevier Neurocomputing

Reviewer, Elsevier Journal of Visual Communication and Image Representation

Reviewer, EURASIP Journal on Image and Video Processing

Reviewer, IET Computer Vision

Reviewer, Journal of Computer Science and Technology

Editorships

Associate Editor of IEEE Transactions on Information Forensics and Security, 2019 -

Guest Editor, Elsevier Pattern Recognition Letters, Special Issue on Data Representation and Representation Learning for Video Analysis, 2018.

Proposal Review Panels

Reviewer, Israel Science Foundation, 2016

Reviewer, Brazilian National Research Council (CNPq) 2014-

Reviewer, Sao Paulo State Research Foundation (FAPESP) 2014-

Reviewer, Pernambuco State Research Foundation (FACEPE) 2015

Reviewer, University of Sao Paulo/COFECUB 2012