André Anjos

Signal Processing Engineer, D.Sc.

Social Information

Date of Birth: December 31, 1973 (48 years old)
Nationality: Swiss and Brazilian
Family: Married, One child

Professional Experience

2018– Scientific Researcher, Idiap Research Institute, Martigny, Switzerland
Head of the Biosignal Processing Group.
Teaching:
- Master in Artificial intelligence, post-graduate level, Idiap/Wallis/Unidistance partnership, Academic Supervisor for Modules M05 (Open Science and Ethics), M06/M08 (Fundamentals of Machine Learning 1 and 2)
- Fundamentals in statistical pattern recognition, post-graduate level, at the École Polytechnique Fédérale de Lausanne (EPLF, Switzerland), EE-612

Supervision:
- Supervision of Driss Khalil, master student on computer-aided segmentation and diagnosis for eye diseases from retinographies
- Supervision of Geoffrey Raposo, master student on computer-aided diagnosis for Tuberculosis exclusion in TB infection patients
- Supervision of Colombine Verzat, master student on Adverse event Detection for Latent Tuberculosis Infection (LTBI) Treatment
- Supervision of Tim Laibacher, graduate student on 2D Eye-fundus Binary Segmentation
- Supervision of Jaden Diefenbaugh, graduate student on work associated with the BEAT platform

Interests:
- Biomedical-related signal processing applications
- Analysis of biomedical records and e-Health
- Diagnostics for medical-related applications
- Image and signal processing
- Pattern recognition and machine learning
- Open-science

Idiap Research Institute, rue Marconi 19, Centre du Parc, Martigny, Switzerland, CH-1920
+41767092708 • +41277217763 • +41277217712
andre.anjos@idiap.ch • andreanjos.org • September 1, 2021

2014–2018 Research Associate, Idiap Research Institute, Martigny, Switzerland

Research on Biometrics, Security and Computing.

Teaching:

- Fundamentals in statistical pattern recognition, post-graduate level, at the École Polytechnique Fédérale de Lausanne (EPLF, Switzerland), EE-612
- Guest Lecturer at State University of São Paulo, Campus Bauru, for the master level course “Special Topics in Reproducible Research Pattern Recognition and Machine Learning", June 2015

Supervision:

- Co-supervision of Ivana Chingovska, doctorate student.

Project writing and involvement:

- FP7 BEAT: contact point for Idiap, leader on 2 work packages. BEAT develops a new open-source online platform for biometric system certification and development;
- CTI Project FEDARS: face recognition using deep architectures;
- Hassler Project COHFACE: remote photo-plethysmography (heart-rate measurements) from webcam images, application to face anti-spoofing;
- CTI Project 3DFingerVein: vein recognition using a finger vein imagery acquired from multiple cameras; Technical lead at Idiap;
- IARPA Project Odin (BATL team): presentation attack detection for face recognition using Visual, NIR and Thermal cameras. Technical contact point;
- Development and management of Bob, a framework for reproducible research in pattern recognition and machine learning.

2010–2013 Post-doctoral Researcher, Idiap Research Institute, Martigny, Switzerland

Research on Biometrics, Security and Computing.

Teaching:

- Fundamentals in statistical pattern recognition, post-graduate level, at the École Polytechnique Fédérale de Lausanne (EPLF, Switzerland), EE-612

Supervision:

- Co-supervision of Ivana Chingovska, doctorate student;
- Co-supervision of Tiago Freitas Pereira and Jükka Mäatta, visiting students;
- Co-supervision of Murali Mohan Chakka, trainee.

Project writing and involvement:

- FP7 BEAT: contact point for Idiap, leader on 2 work packages. BEAT develops a new online platform for biometric system certification and development;
- FP7 TABULA RASA: contact point for Idiap. TABULA RASA investigates sensitiveness to spoofing attacks on biometric systems;
- CTI Project Replay: development of database and counter-measures to spoofing. Construction of working prototypes with the industrial partner (KeyLemon);
- Development and management of Bob, a framework for reproducible research.

2004–2010 Researcher, University of Wisconsin, Madison, USA

Development and construction of the ATLAS Trigger and Data-Acquisition Systems, at CERN, Switzerland.

Supervision:

- Supervision of CERN summer students (three summers);
- Co-supervision Rodrigo Coura Torres, doctorate student.

Achievements:

- Design, development and maintenance of the ATLAS Trigger and Data Acquisition systems. It is currently deployed and operational on more than 5000 machines at CERN and worldwide.

2000–2004 Graduate Student, Federal University of Rio de Janeiro, Brazil

Design and development of a novel algorithm for fast physics triggering based on Calorimetry, Topological Mapping and Neural Networks for the ATLAS Experiment, CERN, Switzerland.

1994–1999 Under Graduate Student, Federal University of Rio de Janeiro, Brazil (includes 1 year intership at CERN, Switzerland)

Signal Processing student.

Achievements:

- Sub-optimal filtering for particle discrimination;
- Neural classifiers implemented in a transputer-based parallel machine;
- Spent 1 year at CERN, Switzerland in a joint project with the university. Participated in the development of early prototypes of the 2nd level-trigger and what would become the final design of the trigger for the ATLAS experiment.

Scientific Contributions

Open Software

2010– Bob, *https://www.idiap.ch/software/bob*, A framework for reproducible research in pattern recognition and machine learning

2012– BEAT, *https://www.beat-eu.org/platform*, A platform for open-science in machine learning and pattern recogntion

Open Data

2016 COHFACE, *https://www.idiap.ch/dataset/cohface*, An open-dataset for studying remote photo-plethysmography

2011 Replay-Attack, *https://www.idiap.ch/dataset/replayattack*, A video dataset for studing presentation-attack detection in Biometrics

Committees

2019– 28th International Joint Conference on Artificial Intelligence, Senior Program Committee

2018 17th International Conference of the Biometrics Special Interest Group, Program Committee

2016 IAPR International Conference on Biometrics, Program Committee

2015 IEEE International Conference on Biometrics: Theory, Applications, and Systems, Participation on Doctoral Consortium

2015 IEEE International Conference on Biometrics: Theory, Applications, and Systems, Chair of special session on “Reproducible Research in Biometrics"

2015 IAPR International Conference on Biometrics, Program Committee

2014 International Workshop on Soft-biometrics, Program Committee, Hosted by ECCV

Memberships

2020– IEEE Engineering in Medicine & Biology Society (EMBS)

2019– Institute of Electrical and Electronics Engineers (IEEE)

Reviewer

2019– International Journal of Computer Vision

2018– IEEE Transactions on Biometrics

2014– Elsevier Image and Vision Computing (IMAVIS)

2013– IEEE Transactions on Information Forensics and Security

2013– IET Biometrics

2012– IEEE Transactions in Image Processing

2012– IEEE Transactions on Circuits and Systems for Video Technology

Education

2001–2006 Doctor, Federal University of Rio de Janeiro, Brazil
D.Sc. degree from the Electronics Engineering School (Signal Processing Laboratory), Post Graduate Program (COPPE). Thesis work developed at CERN, Switzerland in the context of the ATLAS Experiment.

2000–2001 Master, Federal University of Rio de Janeiro, Brazil
M.Sc. degree from the Electronics Engineering School (Signal Processing Laboratory), Post Graduate Program of the Federal University of Rio de Janeiro (COPPE/UFRJ). Thesis work developed at the university in the context of the ATLAS-CERN/UFRJ collaboration.

1994–1999 Engineer, Federal University of Rio de Janeiro, Brazil
Electronics Engineering degree from the Electronics Engineering Department.

1989–1993 Technician, Federal Center of Technology, Rio de Janeiro, Brazil
Technical course in Electronics, taken at the same time as my high-school studies.

Patents

WO2019150254 Method and Device for Biometric Vascular Recognition and/or Identification (granted)

WO2017221049 A data-network connected server, a device, a platform and a method for conducting computer-executable experiments (granted), cf. EU FP7 BEAT Project.

US9973503B2 Method and internet-connected server for reviewing a computer-executable experiment (granted), cf. EU FP7 BEAT Project.

Computer skills

Operating Systems	Proficency in Linux (and other unixes), Mac OSX and Microsoft Windows
Administration	Advanced system and network management. Concepts of networking, firewalling, internet publishing, protocols and architectures
Programming	Advanced knowledge on several structured and object-oriented languages programming. Advanced knowledge on concurrent and parallel programming
Software Management	Advanced experience on building and integrating large software projects, managing releases and software policies, as well as working with collaboration tools for revision control, building, and documenting
Databases	Extensive experience with the use and development of databases

Languages

Portuguese	Mater language
English	Proficient, Read, write and speak fluently
French	Proficient, certified C1-level, Read, write and speak fluently
Spanish	Basic, Basic communication skills, can read well

Off-work

Sports	Alpine skiing, Biking, Tennis, Swimming
Music	Various percussion instruments and brazilian cavaquinho
Computing	Explore new techniques and tools

Quick remarks on publications

H-Index	= 27 (20000+ citations). See my Google Scholar page
Articles	∼30% are journals. I authored and co-authored more than 100 publications. I'm first author on ∼20% of the publications listed on the next section. All articles are available in PDF format at my professional website.

Publications (reverse chronological order)

[1] Matheus A. Renzo, Natália Fernandez, André A. Baceti, Natanael Nunes de Moura Junior, and André Anjos. "Development of a lung segmentation algorithm for analog imaged chest X-Ray: preliminary results". In: XV Brazilian Congress on Computational Intelligence. Joinville, Brazil, Oct. 2021. URL: `https://pypi.org/project/bob.ip.binseg/`.

[2] Adrian Galdran, André Anjos, José Dolz, Hadi Chakor, Hervé Lombaert, and Ismail Ben Ayed. The Little W-Net That Could: State-of-the-Art Retinal Vessel Segmentation with Minimalistic Models. Sept. 2020. arXiv: `2009.01907 [cs.CV]`. URL: `https://arxiv.org/abs/2009.01907`.

[3] Ana Cláudia Barbosa Honório Ferreira, Danton Diego Ferreira, Henrique Ceretta Oliveira, Igor Carvalho de Resende, André Anjos, and Maria Helena Baena de Moraes Lopes. "Competitive neural layer-based method to identify people with high risk for diabetic foot". In: Computers in Biology and Medicine 120 (May 2020). DOI: `10.1016/j.compbiomed.2020.103744`. URL: `http://www.sciencedirect.com/science/article/pii/S0010482520301244`.

[4] Tim Laibacher and André Anjos. On the Evaluation and Real-World Usage Scenarios of Deep Vessel Segmentation for Retinography. Sept. 2019. arXiv: 1909.03856 [cs.CV]. URL: https://arxiv.org/abs/1909.03856.

[5] Lambert Sonna Momo, Luciano Cerqueira Torres, Sébastien Marcel, André Anjos, Michael Liebling, Adrian Shajkofci, Serge Amoos, Alain Woeffray, Alexandre Sierro, Pierre Roduit, Pierre Ferrez, and Lucas Bonvin. "Method and Device for Biometric Vascular Recognition and/or Identification". Patent WO/2019/150254. Aug. 2019. URL: https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2019150254.

[6] Anjith George, Zohreh Mostaani, David Geissenbuhler, Olegs Nikisins, André Anjos, and Sébastien Marcel. "Biometric Face Presentation Attack Detection with Multi-Channel Convolutional Neural Network". In: IEEE Transactions on Information Forensics and Security (May 2019). DOI: 10.1109/TIFS.2019.2916652.

[7] Sushil Bhattacharjee, Amir Mohammadi, André Anjos, and Sébastien Marcel. "Recent Advances in Face Presentation Attack Detection". In: Handbook of Biometric Anti-Spoofing. Ed. by Sébastien Marcel, Mark Nixon, Julian Fierrez, and Nicholas Evans. 2nd edition (in press). Springer-Verlag, Jan. 2019, pp. 207–228. ISBN: ISBN 978-3-319-92627-8. DOI: 10.1007/978-3-319-92627-8_10.

[8] Ivana Chingovska, Amir Mohammadi, André Anjos, and Sébastien Marcel. "Evaluation Methodologies for Biometric Presentation Attack Detection". In: Handbook of Biometric Anti-Spoofing. Ed. by Sébastien Marcel, Mark Nixon, Julian Fierrez, and Nicholas Evans. 2nd edition (in press). Springer-Verlag, Jan. 2019, pp. 457–480. ISBN: ISBN 978-3-319-92627-8. DOI: 10.1007/978-3-319-92627-8_20.

[9] André Anjos, Pedro Tome, and Sébastien Marcel. "An Introduction to Vein Presentation Attacks and Detection". In: Handbook of Biometric Anti-Spoofing. Ed. by Sébastien Marcel, Mark Nixon, Julian Fierrez, and Nicholas Evans. 2nd edition (in press). Springer-Verlag, Jan. 2019, pp. 419–438. ISBN: ISBN 978-3-319-92627-8. DOI: 10.1007/978-3-319-92627-8_18.

[10] Tiago de Freitas Pereira, André Anjos, and Sébastien Marcel. "Heterogeneous Face Recognition Using Domain Specific Units". In: IEEE Transactions on Information Forensics and Security (Dec. 2019). DOI: 10.1109/TIFS.2018.2885284. URL: http://publications.idiap.ch/index.php/publications/show/3963.

[11] Olegs Nikisins, Teodors Eglitis, André Anjos, and Sébastien Marcel. "Fast cross-correlation based wrist vein recognition algorithm with rotation and translation compensation". In: Sixth International Workshop on Biometrics and Forensics. June 2018. DOI: 10.1109/IWBF.2018.8401550. URL: https://publications.idiap.ch/index.php/publications/show/3835.

[12] Marcel Sébastien, André Anjos, and Philip Abbet. "Method and internet-connected server for reviewing a computer-executable experiment". Patent US9973503B2 (US). May 2018. URL: http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=/netahtml/PTO/search-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN/9973503.

[13] Olegs Nikisins, Amir Mohammadi, André Anjos, and Sébastien Marcel. "On Effectiveness of Anomaly Detection Approaches against Unseen Presentation Attacks in Face Anti-Spoofing". In: The 11th IAPR International Conference on Biometrics (ICB 2018). Feb. 2018. DOI: 10.1109/ICB2018.2018.00022. URL: https://publications.idiap.ch/index.php/publications/show/3793.

[14] Guillaume Heusch, André Anjos, and Sébastien Marcel. A reproducible study on remote heart rate measurement. Sept. 2017. arXiv: 1709.00962 [cs-se]. URL: https://arxiv.org/abs/1709.00962.

[15] André Anjos and Sébastien Marcel. "A data-network connected server, a device, a platform and a method for conducting computer-executable experiments". Patent WO/2017/221049 (CH). Dec. 2017. URL: https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2017221049.

[16] André Anjos, Manuel Günther, Tiago de Freitas Pereira, Pavel Korshunov, Amir Mohammadi, and Sébastien Marcel. "Continuously Reproducing Toolchains in Pattern Recognition and Machine Learning Experiments". In: Thirty-fourth International Conference on Machine Learning. Sidney, Australia, Aug. 2017. URL: https://publications.idiap.ch/index.php/publications/show/3666.

[17] André Anjos, Laurent El Shafey, and Sébastien Marcel. "BEAT: An Open-Science Web Platform". In: Thirty-fourth International Conference on Machine Learning. Sydney, Australia, Aug. 2017. URL: https://publications.idiap.ch/index.php/publications/show/3665.

[18] Milos Cernak, Alain Komaty, Amir Mohammadi, André Anjos, and Sébastien Marcel. "Bob Speaks Kaldi". In: Proceedings of Interspeech. Aug. 2017. URL: https://publications.idiap.ch/index.php/publications/show/3623.

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[20] Ivana Chingovska, Nesli Erdogmus, André Anjos, and Sébastien Marcel. "Face Recognition Systems Under Spoofing Attacks". In: Face Recognition Systems Under Spoofing Attacks. 1st edition. Springer International Publishing, Feb. 2016. Chap. 8, pp. 165–194. DOI: 10.1007/978-3-319-28501-6_8.

[21] Aythami Morales, Julian Fierrez, Ruben Tolosana, Javier Ortega-Garcia, Javier Galbally, Marta Gomez-Barrero, André Anjos, and Sébastien Marcel. "Keystroke Biometrics Ongoing Competition". In: IEEE Access 4 (Nov. 2016), pp. 7736–7746. ISSN: 2169-3536. DOI: 10.1109/ACCESS.2016.2626718.

[22] Ivana Chingovska and André Anjos. "On the use of client identity information for face anti-spoofing". In: IEEE Transactions on Information Forensics and Security, Special Issue on Biometric Anti-spoofing 10.4 (Feb. 2015), pp. 787–796. DOI: 10.1109/TIFS.2015.2400392.

[23] Ivana Chingovska, André Anjos, and Sébastien Marcel. "Anti-spoofing: Evaluation Methodologies". In: Encyclopedia of Biometrics. Ed. by Stan Z.Li and Anil Jain. 2nd edition. Springer US, 2014. ISBN: 978-3-642-27733-7. DOI: 10.1007/978-3-642-27733-7.

[24] André Anjos, Ivana Chingovska, and Sébastien Marcel. "Anti-Spoofing: Face Databases". In: Encyclopedia of Biometrics. Ed. by Stan Z.Li and Anil Jain. 2nd edition. Springer US, 2014. ISBN: 978-3-642-27733-7. DOI: 10.1007/978-3-642-27733-7_9212-2.

[25] Ivana Chingovska, André Anjos, and Sébastien Marcel. "Biometrics Evaluation Under Spoofing Attacks". In: IEEE Transactions on Information, Forensics and Security 9.12 (Aug. 2014). DOI: 10.1109/TIFS.2014.2349158.

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[27] Ivana Chingovska, André Anjos, and Sébastien Marcel. "Evaluation Methodologies". In: Handbook of Biometric Anti-Spoofing. Ed. by Sébastien Marcel, Mark Nixon, and Stan Z.Li. Springer-Verlag, 2014. Chap. 10, pp. 185–204. DOI: 10.1007/978-1-4471-6524-8_10.

[28] Stan Z.Li, Javier Galbally, André Anjos, and Sébastien Marcel. "Evaluation Databases". In: Handbook of Biometric Anti-Spoofing. Ed. by Sébastien Marcel, Mark Nixon, and Stan Z.Li. Springer-Verlag, 2014. Chap. Appendix A, pp. 247–278. ISBN: 978-1-4471-6523-1. DOI: 10.1007/978-1-4471-6524-8.

[29] Tiago de Freitas Pereira, Jukka Komulainen, André Anjos, José Mario De Martino, Abdenour Hadid, Matti Pietikainen, and Sébastien Marcel. "Face liveness detection using dynamic texture". In: EURASIP Journal on Image and Video Processing 2014:2 (Jan. 2014). DOI: 10.1186/1687-5281-2014-2.

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[31] Ivana Chingovska, André Anjos, and Sébastien Marcel. "Anti-spoofing in action: joint operation with a verification system". In: Computer Vision and Pattern Recognition Conference - Biometrics Workshop. June 2013. DOI: 10.1109/CVPRW.2013.22.

[32] Tiago de Freitas Pereira, André Anjos, José Mario De Martino, and Sébastien Marcel. "Can face anti-spoofing countermeasures work in a real world scenario?" In: International Conference on Biometrics 2013. June 2013. DOI: 10.1109/ICB.2013.6612981.

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[34] I. Chingovska, J. Yang, Z. Lei, D. Yi, S. Z. Li, O. Kähm, C. Glaser, N. Damer, A. Kuijper, A. Nouak, J. Komulainen, T. Pereira, S. Gupta, S. Khandelwal, S. Bansal, A. Rai, T. Krishna, D. Goyal, M.-A. Waris, H. Zhang, I. Ahmad, S. Kiranyaz, M. Gabbouj, R. Tronci, M. Pili, N. Sirena, F. Roli, J. Galbally, J. Fierrez, A. Pinto, H. Pedrini, W. S. Schwartz, A. Rocha, A. Anjos, and S. Marcel. "The 2nd Competition on Counter Measures to 2D Face Spoofing Attacks". In: International Conference on Biometrics 2013. June 2013. DOI: 10.1109/ICB.2013.6613026.

[35] Tiago de Freitas Pereira, André Anjos, José Mario De Martino, and Sébastien Marcel. "LBP-TOP based countermeasure against facial spoofing attacks". In: International Workshop on Computer Vision With Local Binary Pattern Variants. 2012. DOI: 10.1007/978-3-642-37410-4_11.

[36] André Anjos, Laurent El Shafey, Roy Wallace, Manuel Günther, Chris McCool, and Sébastien Marcel. "Bob: a free signal processing and machine learning toolbox for researchers". In: ACM Multimedia 2012. 2012, pp. 1449–1452. DOI: 10.1145/2393347.2396517.

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[38] André Anjos and Sébastien Marcel. "Counter-Measures to Photo Attacks in Face Recognition: a public database and a baseline". In: International Joint Conference on Biometrics 2011. Oct. 2011. DOI: 10.1109/IJCB.2011.6117503.

[39] Murali Mohan Chakka, André Anjos, Sébastien Marcel, et al. "Competition on Counter Measures to 2-D Facial Spoofing Attacks". In: International Joint Conference on Biometrics 2011. Oct. 2011. DOI: 10.1109/IJCB.2011.6117509.

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[43] The ATLAS Collaboration. "The ATLAS online High Level Trigger framework: experience reusing offline software components in the ATLAS trigger". In: Computing in High Energy and Nuclear Physics, Prague, Czech Republic, 21 - 27 Mar 2009. 2009.

[44] The ATLAS Collaboration. "Configuration and Control of the ATLAS Trigger and Data Acquisition". In: The 1st international conference on Technology and Instrumentation in Particle Physics. 2009.

[45] The ATLAS Collaboration. "Atlas trigger for first physics and beyond". In: Physics at LHC 2008 29 September - October 4, 2008 Split, Croatia. 2009.

[46] The ATLAS Collaboration. "ATLAS Trigger Status and Results From Commissioning Operations". In: Advanced Computing on High-Energy Physics 2008, Erice, Sicily, Italy. 2009.

[47] André Anjos. "Trigger Systems". In: Experimental High-Energy Physics and Associated Technologies Workshop. 2008.

[48] André Anjos on behalf of the ATLAS Collaboration. "The DAQ/HLT system of the ATLAS experiment". In: International Workshop on Advanced Computing and Analysis Techniques in Physics Research. 2008.

[49] The ATLAS Collaboration. "Readiness of the ATLAS Trigger and Data Acquisition system for the first LHC beams". In: 11th Topical Seminar On Innovative Particle And Radiation Detectors, Siena, Italy. 2008.

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[52] The ATLAS Collaboration. "The ATLAS Event Builder". In: IEEE Nuclear Science Symposium and Medical Imaging Conference. 2007.

[53] The ATLAS Collaboration. "The ATLAS trigger - high-level trigger commissioning and operation during early data taking". In: International Europhysics Conference on High Energy Physics. 2007.

[54] The ATLAS Collaboration. "Alignment data streams for the ATLAS Inner Detector". In: Computing for High-Energy Physics. 2007.

[55] Thiago Ciodaro Xavier, André Rabello Anjos, and José Manoel de Seixas. “Discriminação Neural de Partículas para um Detector Submetido a uma Alta Taxa de Eventos”. In: Learning and Nonlinear Models - Revista da Sociedade Brasileira de Redes Neurais (SBRN) 4.2 (Oct. 2007), pp. 79–92.

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[59] André Anjos on behalf of the ATLAS Collaboration. “The Configuration System of the ATLAS Trigger”. In: IEEE Real-time conference. 2007.

[60] The ATLAS Collaboration. “Performance of the final Event Builder for the ATLAS Experiment”. In: 15th IEEE Real Time Conference 2007. 2007.

[61] André Anjos. “Sistema Online de Filtragem em um Ambiente com Alta Taxa de Eventos”. PhD thesis. COPPE/UFRJ, 2006.

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[63] André Anjos on behalf of the ATLAS Collaboration. “Deployment of the ATLAS High-Level Trigger”. In: IEEE Transactions on Nuclear Science 53 (Aug. 2006), pp. 2144–2149.

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