

Sandro Cumani

Curriculum Vitæ

Personal Information

Name: Sandro Cumani
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Year of birth: 1984
Place of birth: Torino, Italy

Education

- 2012 **Ph.D. in Computer and Control Engineering**, *Politecnico di Torino, Italy.*
- 2008 **Master degree in Computer Engineering**, *Politecnico di Torino, Italy.*
- 2006 **BS in Information and Communication Technologies Engineering**, *Politecnico di Torino, Italy, and Institut National Polytechnique de Grenoble, France.*

Qualifications

- 2020 **Italian National Scientific Qualification**, for the role of Full Professor in Information Processing Systems.
- 2019 **Italian National Scientific Qualification**, for the role of Associate Professor in Information Processing Systems.
- 2019 **Italian National Scientific Qualification**, for the role of Associate Professor in Telecommunications.
- 2018 **Italian National Scientific Qualification**, for the role of Associate Professor in Informatics.

Working experience

- 2019 – present **Head of the Speech Recognition Group**, *Politecnico di Torino, Italy.*
- 2022 – present **Associate Professor**, *Politecnico di Torino, Italy*, Main research topics: Speaker and Language Recognition.
- 2019 – 2022 **Tenure-track assistant professor**, *Politecnico di Torino, Italy*, Main research topics: Speaker and Language Recognition, Image Recognition.
- 2017 – 2019 **Assistant professor**, *Politecnico di Torino, Italy*, Main research topics: Speaker and Language Recognition, Image Recognition.

- 2013 – 2017 **Research fellow**, *Politecnico di Torino, Italy*, Main research topic: Speaker and Language Recognition.
- 2013 **External collaborator**, *Politecnico di Torino, Italy*, Main research topic: Speaker and Language Recognition.
- 2012 – 2013 **Academic staff member – Researcher involved in teaching**, *Brno University of Technology, Brno, Czech Republic*, Main research topic: Speaker and Language Recognition.
- 2012 **Research fellow**, *Politecnico di Torino, Italy*, Main research topic: Speaker and Language Recognition.

Research Topics

Speech recognition

GPU-based training of neural networks for phonetic decoding

Machine learning methods for speaker and language recognition

Discriminative classifiers based on high-level speaker and language features and Support Vector Machines

Computational effective approaches for the extraction of high-level utterance representations

Speaker-aware high-level utterance representations

Deep learning approaches for the extraction of utterance representations for speaker and language recognition

Generative non-linear classifiers for speaker and language recognition

Classification approaches for speaker and language recognition in presence of utterances of short duration

Large-scale speaker clustering with speaker-aware measures

Score calibration for speaker verification and identification

Image recognition

Deep learning approaches for fingerprint liveness detection

Machine learning approaches for face recognition

Current teaching activities

- 2019 – present **Main teacher** for the PhD course Machine Learning for Pattern Recognition, *Politecnico di Torino, Italy*
- 2020 – present **Main teacher** for the MS course Machine Learning and Pattern Recognition, *Politecnico di Torino, Italy*

Past teaching activities

Main teacher for the courses Machine Learning for Networking (MS, 2022–2023), Computer Science (BS, 2023–2024), Programming Techniques (BS, 2022–2023), *Politecnico di Torino, Italy*

Teaching assistant for the courses Mimetic Learning (PhD, 2018), Machine Learning for Pattern Recognition (PhD, 2018 – 2019), Intelligenza Artificiale (MS, 2016–2018), Algoritmi e programmazione (BS, 2018–2022), Informatica (BS, 2019–2020, 2009–2012), *Politecnico di Torino, Italy*

Teaching assistant for the course Signal and Systems (BS, 2012 – 2013), *Brno University of Technology, Czech Republic*

Funded projects

- 2023 Responsible for Nuance-funded project “Speaker recognition and Diarization – DNN embeddings”, *Politecnico di Torino, Italy*
- 2022 Responsible for Nuance-funded project “Speaker recognition and Diarization – Score normalization, HMM-GMM voiceprints and DNN embeddings”, *Politecnico di Torino, Italy*
- 2021 Responsible for Nuance-funded project “Speaker recognition and Diarization – Large-scale clustering and privacy-aware score normalization”, *Politecnico di Torino, Italy*
- 2020 Responsible for Nuance-funded project “Speaker recognition and Diarization – Non linear, large-scale and semi-supervised extensions of discriminative classifiers”, *Politecnico di Torino, Italy*
- 2018 Co-responsible for Nuance-funded project “Speaker recognition using DNN for exploring phonetic information – Non-linear models for speaker and language recognition”, *Politecnico di Torino, Italy*
- 2017 Co-responsible for Nuance-funded project “Speaker recognition using DNN for exploring phonetic information”, *Politecnico di Torino, Italy*

Editorial activity

- 2019–2024 **Associate Editor** for “IEEE Signal Processing Letters”, *IEEE*
- 2019–2021 **Editor** of “Increasing Naturalness and Flexibility in Spoken Dialogue Interaction - 10th International Workshop on Spoken Dialogue Systems”, *Lecture Notes in Electrical Engineering, Springer, 2021*
- 2018–2019 **Guest Editor** for the Special Issue “Advances in Deep Learning”, *Applied Sciences, MDPI*

Other activities

Area Chair for the “IEEE Spoken Language Technology Workshop” 2021, *Virtual Technical Program Chair* and **Scientific Committee Chair** for the “International Workshop on Spoken Dialogue Systems Technology (IWSDS) 2019”, *Siracusa, Italy*
Session Chair, Interspeech 2015 and 2019, IWSDS 2019, SLT 2021

Reviewer for several international journals, including: IEEE Transactions on Audio, Speech and Language Processing, IEEE/ACM Transactions on Audio, Speech and Language Processing, IEEE Signal Processing Letters, Journal of Parallel and Distributed Computing, Speech Communication, IEEE Transactions on Cybernetics, The Journal of Signal Processing Systems, Engineering Applications of Artificial Intelligence, IEEE Access, IET Biometrics, EURASIP Journal on Audio Speech and Music Processing, Digital Signal Processing

Reviewer for several conferences, including: Odyssey 2014, 2016, 2018 and 2022, ICASSP 2017, 2018, 2019, 2020 and 2021, Interspeech 2016, 2017, 2018, 2019, 2020, 2021, 2022 and 2023, ASRU 2017 and 2021, IWSDS 2019

Organization of the “TOSREW: Speaker Recognition Summer Workshop 2015”, *Politecnico di Torino, Italy*

Summary of publications

- **Journal articles:** 19
- **Conference proceedings:** 40
- **Book chapters:** 1
- **Editorials:** 1
- **Curatorships:** 1
- **Patents:** 2

Publications list

Journal articles

- [1] A. Koudounas, E. Pastor, G. Attanasio, V. Mazzia, M. Giollo, T. Gueudre, E. Reale, L. Cagliero, S. Cumani, L. de Alfaro, E. Baralis, and D. Amberti, "Towards comprehensive subgroup performance analysis in speech models," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 32, pp. 1468–1480, 2024. DOI: 10.1109/TASLP.2024.3363447.
- [2] S. Cumani and S. Sarni, "The distributions of uncalibrated speaker verification scores: A generative model for domain mismatch and trial-dependent calibration," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 31, pp. 2204–2219, 2023. DOI: 10.1109/TASLP.2023.3282096.
- [3] P. Negri, S. Cumani, and A. Bottino, "Tackling age-invariant face recognition with non-linear plda and pairwise svm," *IEEE Access*, vol. 9, pp. 40649–40664, 2021. DOI: 10.1109/ACCESS.2021.3063819.
- [4] S. Cumani, "On the distribution of speaker verification scores: Generative models for unsupervised calibration," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 29, pp. 547–562, 2021. DOI: 10.1109/TASLP.2020.3040103.
- [5] S. Cumani and P. Laface, "Exact memory–constrained upgma for large scale speaker clustering," *Pattern Recognition*, vol. 95, pp. 235–246, 2019. ISSN: 0031-3203, DOI: 10.1016/j.patcog.2019.06.018.
- [6] S. Cumani and P. Laface, "Scoring heterogeneous speaker vectors using nonlinear transformations and tied PLDA models," *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 26, pp. 995–1009, May 2018. ISSN: 2329-9290, DOI: 10.1109/TASLP.2018.2806305.
- [7] S. Cumani and P. Laface, "Speaker recognition using e–vectors," *IEEE/ACM TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 26, no. 4, pp. 736–748, 2018. ISSN: 2329-9290, DOI: 10.1109/TASLP.2018.2791806.
- [8] A. Toosi, A. Bottino, S. Cumani, P. Negri, and P. L. Sottile, "Feature fusion for fingerprint liveness detection: a comparative study," *IEEE ACCESS*, vol. 5, pp. 23695–23709, 2017. ISSN: 2169-3536, DOI: 10.1109/ACCESS.2017.2763419.
- [9] S. Cumani and P. Laface, "Joint estimation of PLDA and nonlinear transformations of speaker vectors," *IEEE/ACM TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 25, no. 10, pp. 1890–1900, 2017. ISSN: 2329-9290, DOI: 10.1109/TASLP.2017.2724198.
- [10] S. Cumani and P. Laface, "Non–linear i–vector transformations for PLDA based speaker recognition," *IEEE/ACM TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 25, no. 4, pp. 908–919, 2017. ISSN: 2329-9290, DOI: 10.1109/TASLP.2017.2674966.

- [11] S. Cumani, "Fast scoring of full posterior PLDA models," *IEEE/ACM TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 23, no. 11, pp. 2036–2045, 2015. ISSN: 2329-9290, DOI: 10.1109/TASLP.2015.2464678.
- [12] S. Cumani and P. Laface, "Large scale training of pairwise support vector machines for speaker recognition," *IEEE/ACM TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 22, no. 11, pp. 1590–1600, 2014. ISSN: 2329-9290, DOI: 10.1109/TASLP.2014.2341914.
- [13] S. Cumani, O. Plchot, and P. Laface, "On the use of i-vector posterior distributions in Probabilistic Linear Discriminant Analysis," *IEEE/ACM TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 22, no. 4, pp. 846–857, 2014. ISSN: 2329-9290, DOI: 10.1109/TASLP.2014.2308473.
- [14] S. Cumani and P. Laface, "Factorized sub-space estimation for fast and memory effective i-vector extraction," *IEEE/ACM TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 22, no. 1, pp. 248–259, 2014. ISSN: 2329-9290, DOI: 10.1109/TASLP.2013.2290505.
- [15] S. Cumani, N. Brummer, L. Burget, P. Laface, O. Plchot, and V. Vasilakakis, "Pairwise discriminative speaker verification in the i-vector space," *IEEE TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 21, no. 6, pp. 1217–1227, 2013. ISSN: 1558-7916, DOI: 10.1109/TASL.2013.2245655.
- [16] S. Cumani and P. Laface, "Memory and computation trade-offs for efficient i-vector extraction," *IEEE TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 21, no. 5, pp. 934–944, 2013. ISSN: 1558-7916, DOI: 10.1109/TASL.2013.2239291.
- [17] S. Cumani and P. Laface, "Analysis of large-scale SVM training algorithms for language and speaker recognition," *IEEE TRANSACTIONS ON AUDIO, SPEECH, AND LANGUAGE PROCESSING*, vol. 20, no. 5, pp. 1585–1596, 2012. ISSN: 1558-7916, DOI: 10.1109/TASL.2012.2186290.
- [18] S. Scanzio, S. Cumani, R. Gemello, F. Mana, and P. Laface, "Parallel implementation of artificial neural network training for speech recognition," *PATTERN RECOGNITION LETTERS*, vol. 31, no. 11, pp. 1302–1309, 2010. ISSN: 0167-8655, DOI: 10.1016/j.patrec.2010.02.003.
- [19] A. Bottino and S. Cumani, "A fast and robust method for the identification of face landmarks in profile images," *WSEAS TRANSACTIONS ON COMPUTERS*, vol. 7, no. 8, pp. 1250–1259, 2008. ISSN: 1109-2750.

Conference proceedings

- [20] A. Koudounas, E. Pastor, V. Mazzia, M. Giollo, T. Gueudre, E. Reale, G. Attanasio, L. Cagliero, S. Cumani, L. de Alfaro, E. Baralis, and D. Amberti, "Leveraging confidence models for identifying challenging data subgroups in speech models," in *ICASSP 2024*, 2024.

- [21] S. Cumani and S. Sarni, "From adaptive score normalization to adaptive data normalization for speaker verification systems," in *Proc. INTERSPEECH 2023*, pp. 5296–5300, 2023. ISSN: 2308-457X, DOI: 10.21437/Interspeech.2023-266.
- [22] S. Sarni, S. Cumani, S. M. Siniscalchi, and A. Bottino, "Description and analysis of the KPT system for NIST Language Recognition Evaluation 2022," in *Proc. INTERSPEECH 2023*, pp. 1933–1937, 2023. ISSN: 2308-457X, DOI: 10.21437/Interspeech.2023-155.
- [23] S. Cumani and S. Sarni, "Impostor Score Statistics as Quality Measures for the Calibration of Speaker Verification Systems," in *Proc. The Speaker and Language Recognition Workshop (Odyssey 2022)*, pp. 25–32, 2022. DOI: 10.21437/Odyssey.2022-4.
- [24] S. Cumani and S. Sarni, "A Generative Model for Duration-Dependent Score Calibration," in *Proc. Interspeech 2021*, pp. 4598–4602, 2021. ISSN: 2308-457X, DOI: 10.21437/Interspeech.2021-114.
- [25] S. Cumani, "Normal Variance-Mean Mixtures for Unsupervised Score Calibration," in *Proc. Interspeech 2019*, pp. 401–405, 2019. ISSN: 2308-457X, DOI: 10.21437/Interspeech.2019-1609.
- [26] S. Cumani and P. Laface, "Tied normal variance–mean mixtures for linear score calibration," in *ICASSP 2019 - 2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 6121–6125, 2019. DOI: 10.1109/ICASSP.2019.8683379.
- [27] O. Plchot, P. Matjka, O. Novotny, S. Cumani, A. Lozano-Diez, J. Slavicek, M. Diez, F. Grezl, O. Glembek, K. V. Mounika, A. Silnova, L. Burget, L. Ondel, S. Kesiraju, and J. Rohdin, "Analysis of BUT-PT submission for NIST LRE 2017," in *Odyssey 2018: The Speaker and Language Recognition Workshop*, (Les Sables d’Olonne, France), 2018.
- [28] A. Toosi, S. Cumani, and A. Bottino, "CNN patch-based voting for fingerprint liveness detection," in *Proc. of 9th International Joint Conference on Computational Intelligence (IJCI 2017)*, (Funchal, Portugal), INSTICC, 2017. ISBN: 978-989-758-274-5, DOI: 10.5220/0006582101580165.
- [29] D. Colibro, C. Vair, E. Dalmaso, K. Farrell, G. Karvitsky, S. Cumani, and P. Laface, "Nuance – Politecnico di Torino’s 2016 NIST Speaker Recognition Evaluation system," in *Proceedings of Interspeech 2017*, (Stockholm, Sweden), pp. 1338–1342, International Speech Communication Association, 2017. ISSN: 1990-9772, DOI: 10.21437/Interspeech.2017-797.
- [30] S. Cumani and P. Laface, "E–vectors: JFA and i–vectors revisited," in *IEEE International Conference on Acoustics Speech and Signal Processing ICASSP 2017*, (New Orleans, USA), pp. 5435–5439, IEEE Signal Processing Society, 2017. ISSN: 2379-190X, ISBN: 978-1-5090-4117-6, DOI: 10.1109/ICASSP.2017.7953195.
- [31] S. Cumani and P. Laface, "I–vector transformation and scaling for PLDA based speaker recognition," in *Odyssey 2016 - The Speaker and Language Recognition Workshop*, (Bilbao, Spain), pp. 39–46, ISCA, 2016. ISSN: 2312-2846.

- [32] O. Plchot, P. Matejka, R. Fer, O. Glembek, O. Novotny, J. Pesan, K. Vesely, L. Ondel, M. Karafiat, F. Grezl, S. Kesiraju, L. Burget, N. Brummer, A. Swart, S. Cumani, S. H. Mallidi, and R. Li, "BAT system description for NIST LRE 2015," in *Odyssey 2016: The Speaker and Language Recognition Workshop*, (Bilbao, Spain), pp. 166–173, ISCA, 2016. ISSN: 2312-2846.
- [33] A. Sholokhov, T. Kinnunen, and S. Cumani, "Discriminative multi-domain PLDA for speaker verification," in *ICASSP 2016*, (Shanghai, China), pp. 5030–5034, 2016. ISSN: 2379-190X, ISBN: 978-1-4799-9988-0, DOI: 10.1109/ICASSP.2016.7472635.
- [34] A. Toosi, S. Cumani, and A. Bottino, "On multiview analysis for fingerprint liveness detection," in *Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications* (A. Pardo and J. Kittler, eds.), (Montevideo, Uruguay), pp. 143–150, Springer International Publishing, 2015. ISBN: 978-3-319-25751-8.
- [35] S. Cumani, O. Plchot, and R. Fer, "Exploiting i-vector posterior covariances for short-duration language recognition," in *Proceedings of Interspeech 2015*, (Dresden, Germany), pp. 1002–1006, ISCA, 2015. ISSN: 2308-457X, ISBN: 9781510817906.
- [36] S. Cumani, P. Laface, and F. Kulsoom, "Speaker recognition by means of acoustic and phonetically informed GMMs," in *Proceedings of Interspeech 2015*, vol. 1, (Dresden, Germany), pp. 200–204, International Speech Communication Association, 2015. ISSN: 2308-457X, ISBN: 9781510817906.
- [37] S. Cumani and P. Laface, "Memory-aware i-vector extraction by means of subspace factorization," in *Proceedings of ICASSP 2015*, (South Brisbane, Queensland, Australia), pp. 4669–4673, IEEE - INST ELECTRICAL ELECTRONICS ENGINEERS INC, 2015. ISBN: 9781467369961, DOI: 10.1109/ICASSP.2015.7178856.
- [38] S. Cumani and P. Laface, "Generative pairwise models for speaker recognition," in *Odyssey 2014: The Speaker and Language Recognition Workshop*, (Joensuu, Finland), pp. 273–279, International Speech Communication Association, 2014. ISSN: 2312-2846.
- [39] S. Cumani and P. Laface, "Training pairwise Support Vector Machines with large scale datasets," in *2014 IEEE International Conference on Acoustics, Speech, and Signal Processing ICASSP 2014*, (Florence, Italy), IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC, 2014. ISSN: 1520-6149, DOI: 10.1109/ICASSP.2014.6853877.
- [40] O. Plchot, S. Matsoukas, P. Matejka, N. Dehak, J. Ma, S. Cumani, O. Glembek, H. Hermansky, S. Mallidi, N. Mesgarami, R. Schwartz, M. Soufifar, Z. Tan, S. Thomas, B. Zhang, and X. Zhou, "Developing a speaker identification system for the DARPA RATS project," in *Proceedings of ICASSP 2013*, (Vancouver, Canada), pp. 6768–6772, 2013. ISSN: 1520-6149, ISBN: 9781479903559, DOI: 10.1109/ICASSP.2013.6638972.
- [41] S. Cumani and P. Laface, "Fast and memory effective i-vector extraction using a factorized sub-space," in *Proceedings of Interspeech 2013*, (Lyon, France), pp. 1599–1603, International Speech Communication Association, 2013. ISSN: 2308-457X, ISBN: 9781629934433.

- [42] D. Colibro, C. Vair, K. Farrell, N. Krause, G. Karvitsky, S. Cumani, and P. Laface, "Nuance – Politecnico di Torino's 2012 NIST Speaker Recognition Evaluation system," in *Proceedings of Interspeech 2013*, (Lyon, France), pp. 1996–2000, International Speech Communication Association, 2013. ISSN: 2308-457X, ISBN: 9781629934433.
- [43] M. Soufifar, L. Burget, O. Plchot, S. Cumani, and J. Cernocky, "Regularized subspace n-gram model for phonotactic iVector extraction," in *Proceedings of Interspeech 2013*, (Lyon, France), pp. 74–78, International Speech Communication Association, 2013. ISSN: 2308-457X, ISBN: 9781629934433.
- [44] S. Cumani, O. Plchot, and P. Laface, "Probabilistic linear discriminant analysis of i-vector posterior distributions," in *Proceedings 2013 IEEE International Conference on Acoustics, Speech, and Signal Processing ICASSP 2013*, (Vancouver, Canada), pp. 7644–7648, IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC, 2013. ISSN: 1520-6149, ISBN: 9781479903559, DOI: 10.1109/ICASSP.2013.6639150.
- [45] V. Vasilakakis, S. Cumani, and P. Laface, "Speaker recognition by means of deep belief networks," in *BTFS 2013*, (Nijmegen, Netherlands), BBfor2, 2013.
- [46] N. Brummer, S. Cumani, O. Glembek, M. Karafiat, P. Matejka, J. Pesan, O. Plchot, M. Soufifar, E. De Villiers, and J. Cernocky, "Description and analysis of the Brno276 system for LRE2011," in *Proceedings of Odyssey 2012: The Speaker and Language Recognition Workshop*, (Singapore), pp. 216–223, International Speech Communication Association, 2012. ISBN: 9789810730932.
- [47] M. Soufifar, S. Cumani, L. Burget, and J. Cernocky, "Discriminative classifiers for phonotactic language recognition with iVectors," in *Proceedings of the 37th International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2012)*, (Kyoto, Japan), pp. 4853–4856, IEEE, 2012. ISSN: 1520-6149, ISBN: 9781467300445, DOI: 10.1109/ICASSP.2012.6289006.
- [48] S. Cumani, O. Glembek, N. Brummer, E. De Villiers, and P. Laface, "Gender independent discriminative speaker recognition in i-vector space," in *Proceedings of the 37th International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2012)*, (Kyoto, Japan), pp. 4361–4364, IEEE, 2012. ISSN: 1520-6149, ISBN: 9781467300445, DOI: 10.1109/ICASSP.2012.6288885.
- [49] S. Cumani, O. Plchot, and M. Karafiat, "Independent component analysis and MLLR transforms for speaker identification," in *Proceedings of the 37th International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2012)*, (Kyoto, Japan), pp. 4365–4368, IEEE, 2012. ISSN: 1520-6149, ISBN: 9781467300445, DOI: 10.1109/ICASSP.2012.6288886.
- [50] S. Cumani, P. Laface, and V. Vasilakakis, "Memory and computation effective approaches for i-vector extraction," in *Odyssey 2012: The Speaker and Language Recognition Workshop*, (Singapore), pp. 9–15, ISCA, 2012. ISBN: 9789810730932.
- [51] S. Cumani, P. D. Batzu, D. Colibro, C. Vair, P. Laface, and V. Vasilakakis, "Comparison of speaker recognition approaches for real applications," in *Proceedings*

of the 12th Annual Conference of the International Speech Communication Association - INTERSPEECH 2011, (Florence, Italy), pp. 2365–2368, ISCA, 2011. ISBN: 9781618392701.

- [52] L. Burget, O. Plchot, S. Cumani, O. Glembek, P. Matejka, and N. Brummer, “Discriminatively trained probabilistic linear discriminant analysis for speaker verification,” in *Proceedings of 2011 IEEE International Conference on Acoustics, Speech and Signal Processing ICASSP 2011*, (Prague, Czech Republic), pp. 4832–4835, IEEE, 2011. ISSN: 1520-6149, ISBN: 9781457705397, DOI: 10.1109/ICASSP.2011.5947437.
- [53] S. Cumani, N. Brummer, L. Burget, and P. Laface, “Fast discriminative speaker verification in the i-vector space,” in *Proceedings of 2011 IEEE International Conference on Acoustics, Speech, and Signal Processing ICASSP 2011*, (Prague, Czech Republic), pp. 4852–4855, IEEE, 2011. ISSN: 1520-6149, ISBN: 9781457705373, DOI: 10.1109/ICASSP.2011.5947442.
- [54] F. Castaldo, D. Colibro, C. Vair, S. Cumani, and P. Laface, “Loquendo – Politecnico di Torino’s 2010 NIST Speaker Recognition Evaluation system,” in *Proceedings of 2011 IEEE International Conference on Acoustics, Speech, and Signal Processing ICASSP 2011*, (Prague, Czech Republic), pp. 5464–5467, IEEE, 2011. ISSN: 1520-6149, ISBN: 9781457705397, DOI: 10.1109/ICASSP.2011.5947595.
- [55] S. Cumani, F. Castaldo, P. Laface, D. Colibro, and C. Vair, “Comparison of large-scale SVM training algorithms for language recognition,” in *Proceedings Odyssey 2010*, (Brno, Czech Republic), ISCA, 2010. ISBN: 9781617821226.
- [56] F. Castaldo, D. Colibro, S. Cumani, E. Dalmaso, P. Laface, and C. Vair, “Loquendo – Politecnico di Torino system for the 2009 NIST Language Recognition Evaluation,” in *Proceedings of 2010 IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP)*, (Dallas, USA), pp. 5002–5005, IEEE, 2010. ISSN: 1520-6149, ISBN: 9781424442966, DOI: 10.1109/ICASSP.2010.5495082.
- [57] S. Scanzio, S. Cumani, R. Gemello, F. Mana, and P. Laface, “Parallel implementation of artificial neural network training,” in *Proceedings of 2010 IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP)*, (Dallas, USA), pp. 4902–4905, IEEE, 2010. ISSN: 1520-6149, ISBN: 9781424442966, DOI: 10.1109/ICASSP.2010.5495108.
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- [59] A. Bottino and S. Cumani, “Robust identification of face landmarks in profile images,” in *Proceedings of the 12th WSEAS International Conference on Computers, ICCOMP’08*, (Heraklion, Greece), pp. 107–114, World Scientific and Engineering Academy and Society (WSEAS), 2008. ISBN: 978-960-6766-85-5.

Book chapters

- [60] A. Toosi, S. Cumani, and A. Bottino, "Assessing transfer learning on convolutional neural networks for patch-based fingerprint liveness detection," in *Computational Intelligence* (C. Sabourin, J. J. Merelo, K. Madani, and K. Warwick, eds.), (Cham), pp. 263–279, Springer International Publishing, 2019. ISBN: 978-3-030-16469-0.

Curatorships / Editorials

- [61] E. Marchi, S. M. Siniscalchi, S. Cumani, V. M. Salerno, and H. Li, eds., *Increasing Naturalness and Flexibility in Spoken Dialogue Interaction*. Lecture Notes in Electrical Engineering, Springer, 2022.
- [62] D. Gagnaniello, A. Bottino, S. Cumani, and W. Kim, "Special issue on advances in deep learning," *Applied Sciences*, vol. 10, no. 9, 2020. ISSN: 2076-3417, DOI: 10.3390/app10093172.

Patents

- [63] S. Cumani, C. Vair, D. E. Colibro, P. Laface, and K. R. Farrel, "Fast speaker recognition scoring using i-vector posteriors and Probabilistic Linear Discriminant Analysis," 2016. US 9373330 B2.
- [64] S. Cumani and P. Laface, "Method and apparatus for efficient i-vector extraction," 2016. US 9406298 B2.