Publication List

The following lists my publications (and a brief explanation) including:

- *5 publications as a primary author (and 7 analysis notes)*
- *2 publications as direct collaborator*
- *11 publications due to my contribution to boosted b-jet tagging*
- *>20 publications due to work on boosted W-jet tagging*
- *In addition, my contributions to the pixel detector gain calibration have led CMS to at least 40 publications (as of April 2019) including the first observation of the Higgs boson decay to bottom quarks (Phys. Rev. Lett. 121 (2018) 121801) where the pixel detector is essential for b-tagging (links here and here)*

PUBLICATIONS (MAIN AUTHOR)

"Search for massive resonances decaying into WW, WZ , ZZ , qW, and qZ with dijet final states at $\sqrt{s}$ = 13 TeV" (2.6 fb^{-1}), Physical Review D, DOI: https://doi.org/10.1103/PhysRevD.97.072006

"Search for massive resonances decaying into WW, WZ or ZZ bosons in proton-proton collisions at $\sqrt{s}$ =13 TeV" (35.9 fb^{-1}), Journal of High Energy Physics, DOI: https://doi.org/10.1007/JHEP03(2017)162

"Search for heavy resonances in the all-hadronic vector-boson pair final state with a multi-dimensional fit ", CMS Physics Analysis Summary, B2G-18-002, https://cds.cern.ch/record/2668755 (submitted to EJPC)

"Jet algorithms performance in 13 TeV data", CMS Physics Analysis Summary (CMS internally peer-reviewed), https://cds.cern.ch/record/2256875 (main author of chapter of W-tagging)

"W-tagging performance in 13 TeV", CMS Detector Performance Note (CMS internally peer-reviewed), CMS-DP-2016-039, https://cds.cern.ch/record/2202970

ANALYSIS NOTES (MAIN AUTHOR)

"LoLa: A Lorentz Group Based Deep Neural Network for W-tagging.", CMS Analysis Note 2018/099, 2018.

"Search for VV resonances in the all-hadronic final state with a multi-dimensional fit to the masses of the jets and the dijet resonance mass.", CMS Analysis Note 2017/303, 2017.

"Calibration of boosted hadronic W/Z bosons in 2016 data.", CMS Analysis Note 2016/342, 2016.

"Search for heavy resonances in the W/Z-tagged dijet mass spectrum at 13 TeV.", CMS Analysis Note 2016/235, 2016.

"Identification and calibration of boosted hadronic W/Z bosons at 13 TeV.", CMS Analysis Note 2016/215, 2016.

"b-tagging efficiency measurement using semi-leptonic tt events.", CMS Analysis Note 2015/210, 2015.

"Comparison of b-tagging algorithms in CMS for jets with high transverse momenta containing multiple b quarks.", CMS Analysis Note 2014/076, 2014.

PUBLICATIONS (DIRECT CONTRIBUTOR)

"Combination of searches for heavy resonances decaying to WW, WZ, ZZ, WH, and ZH boson pairs in proton-proton collisions at $\sqrt{s}$ = 8 and 13 TeV", CMS-B2G-16-007, Phys. Let. B, DOI:10.1016/j.physletb. 2017.09.083.

"Search for low-mass resonances decaying to boosted jets", Physical Review Letters, DOI: https://doi.org/10.1103/PhysRevLett.119.111802

"Identification of double-b quark jets in boosted event topologies", CMS Physics Analysis Summary, https://cds.cern.ch/record/2195743

PUBLICATIONS (RESULTING FROM W-TAGGING ALGORITHM)

The following 22 publications rely on my work on calibrating a new vector boson tagging algorithm together with corresponding data/ simulation scalefactors for tagging efficiency and dedicated jet mass corrections.

"Inclusive search for supersymmetry in pp collisions at √ s = 13 TeV using razor variables and boosted object identification in zero and one lepton final states", JHEP, CMS-SUS-16-017, arXiv:1812.06302
"Search for a W' boson decaying to a vector-like quark and a top or bottom quark in the all-jets final state ", JHEP, CMS-B2G-18-001, arXiv: 1811.07010

"Search for low-mass resonances decaying into bottom quark-antiquark pairs in proton-proton collisions at √ s =13 TeV", Phys.Rev. D99 (2019) no.1, DOI: 10.1103/PhysRevD.99.012005, CMS-EXO-17-024, arXiv: 1810.11822

"Search for pair-produced resonances decaying to quark pairs in proton-proton collisions at √ s = 13 TeV", Phys.Rev. D98 (2018) no.11, DOI: 10.1103/PhysRevD.98.112014 CMS-EXO-17-021, arXiv: 1808.03124

"Search for production of Higgs boson pairs in the four b quark final state using large-area jets in proton-proton collisions at √ s = 13 TeV", JHEP 1901 (2019) 040, DOI: 10.1007/JHEP01(2019)040 CMS-B2G-17-019, arXiv:1808.01473

"Search for single production of vector-like quarks decaying to a top quark and a W boson in proton-proton collisions at √ s = 13 TeV" Eur.Phys.J. C79 (2019) 90, DOI: 10.1140/epjc/s10052-019-6556-3, CMS-B2G-17-018, arXiv:1809.08597

"Prospects for a Measurement of the *W*W Boson Mass in the All-Jets Final State at Hadron Colliders"
Marat Freytsis et. al. , JHEP 1902 (2019) 003, DOI: 10.1007/ JHEP02(2019)003, FERMILAB-PUB-18-315-E, arXiv:1807.07454

"Search for heavy resonances decaying into a vector boson and a Higgs boson in final states with charged leptons, neutrinos and b quarks at √ s =13 TeV", JHEP 1811 (2018) 172 DOI: 10.1007/JHEP11(2018)172 CMS-B2G-17-004, arXiv:1807.02826

"Search for a heavy resonance decaying to a top quark and a vector-like top quark in the lepton+jets final state", Eur. Phys. J. C (2019) 79:208 , CMS-PAS-B2G-17-015, DOI:10.1140/epjc/s10052-019-6688-5

"Search for vector-like T or B quark pairs in leptonic final states in 36 fb−1 of proton-proton collisions at √ s = 13 TeV", CMS PAS B2G-17-011, JHEP (2018) 2018:177, https://doi.org/10.1007/JHEP08(2018)177

"Search for heavy Majorana neutrinos in the same-sign dilepton channel in proton-proton collisions at √ s = 13 TeV"
CMS PAS EXO-17-028, JHEP (2019) 2019: 122. https://doi.org/10.1007/JHEP01(2019)122

"Search for a heavy resonance decaying to a pair of vector bosons in the lepton plus merged jet final state at √ s = 13 TeV"
CMS-B2G-16-029, J. High Energ. Phys. (2018) 2018: 88. https://doi.org/10.1007/JHEP05(2018)088

"Search for heavy resonances decaying into two Higgs bosons or into a Higgs and a vector boson in proton-proton collisions at 13 TeV"
B2G-17-006, JHEP(2019) 2019: 51. https://doi.org/10.1007/JHEP01(2019)051

"Search for new heavy resonances decaying into a Z boson and a massive vector boson in the 2`2q final state at √ s = 13 TeV"
B2G-17-013, J. High Energ. Phys. (2018) 2018: 101. https://doi.org/10.1007/JHEP09(2018)101

"Search for a massive resonance decaying to a pair of Higgs bosons in the four b quark final state in proton-proton collisions at √ s = 13 TeV"
CMS-B2G-16-026, Physics Letters B, DOI:10.1016/j.physletb.2018.03.084

"Search for new physics in final states with an energetic jet or a hadronically decaying W or Z boson and transverse momentum imbalance at √ s = 13 TeV"
EXO-16-048, PRD, DOI:10.1103/PhysRevD.97.092005.

"Search for Zγ resonances using leptonic and hadronic final states in proton-proton collisions at √ s = 13 TeV"
CMS-EXO-17-005, JHEP, DOI:10.1007/JHEP09(2018)148

"Inclusive search for a highly boosted Higgs boson decaying to a bottom quark-antiquark pair"
CMS-HIG-17-010, PRL, DOI:10.1103/PhysRevLett.120.071802.

"Search for heavy resonances that decay into a vector boson and a Higgs boson in hadronic final states at √ s = 13 TeV"
CMS-B2G-17-002, EPJC DOI:10.1140/epjc/s10052-017-5192-z.

"Search for pair production of vector-like T and B quarks in single-lepton final states using boosted jet substructure in proton-proton collisions at √ s = 13 TeV"
CMS-B2G-16-024, JHEP, doi:10.1007/JHEP11(2017)085.

PUBLICATIONS (RESULTING FROM B-TAGGING ALGORITHM)

The following 11 publications rely on my contribution to the optimisation of a dedicated Higgs (bb) tagging algorithm

"Statistical combination of CMS searches for heavy resonances decaying to a pair of bosons or leptons at √ s =13 TeV", CMS Collaboration, CMS-PAS-B2G-18-006

"Combined measurements of Higgs boson couplings in proton-proton collisions at √ s = 13 TeV", CMS Collaboration, submitted to Eur.Phys.J., CMS-HIG-17-031, arXiv:1809.10733

"Exploring Sensitivity to NMSSM Signatures with Low Missing Transverse Energy at the LHC",A. Titterton et al., JHEP 1810 (2018) 064, DOI: 10.1007/JHEP10(2018)064, arXiv:1807.10672

"Search for associated production of dark matter with a Higgs boson that decays to a pair of bottom quarks",CMS Collaboration, CMS-PAS-EXO-16-050

"Search for physics beyond the standard model in events with Higgs bosons and missing transverse momentum in proton-proton collisions at $\sqrt{s}$ = 13 TeV", CMS Collaboration, CMS-PAS-SUS-17-006

"Inclusive search for a highly boosted Higgs boson decaying to a bottom quark-antiquark pair", CMS Collaboration, Phys.Rev.Lett. 120 (2018) no.7, 071802, CMS-HIG-17-010, DOI: 10.1103/PhysRevLett. 120.071802, arXiv:1709.05543

"Search for heavy resonances that decay into a vector boson and a Higgs boson in hadronic final states at $\sqrt{s}$ = 13 TeV", CMS Collaboration, Eur.Phys.J. C77 (2017) no.9, 636, CMS-B2G-17-002, DOI: 10.1140/epjc/s10052-017-5192-z, arXiv:1707.01303

"Inclusive search for the standard model Higgs boson produced in pp collisions at $\sqrt{s}$ = 13 TeV using $H \rightarrow b\bar{b}$ decays", CMS Collaboration, CMS-PAS-HIG-17-010

"Jet Substructure Studies with CMS Open Data", Aashish Tripathee et. al, Phys.Rev. D96 (2017) no.7, DOI: 10.1103/PhysRevD.96.074003, arXiv:1704.05842

"Search for heavy resonances decaying into a vector boson and a Higgs boson in hadronic final states with 2016 data", CMS Collaboration, CMS-PAS-B2G-17-002

"Search for direct top squark pair production in the all-hadronic final state in proton-proton collisions at $\sqrt{s}$ = 13 TeV", CMS Collaboration, CMS-PAS-SUS-16-049

THESES

"A Novel Multidimensional Search for Diboson Resonances in the Boosted Dijet Final State and Encoding Jet Substructure with a Deep Neural Network", Ph.D. Thesis, March 2019, github.com/thaarres/PhD_thesis/blob/master/phd_aarrestad_main.pdf

"A dedicated boosted Higgs boson tagging algorithm at CMS", M.S. Thesis, Oct 2014, https://thaarres.web.cern.ch/thaarres/MasterThesis_TAarrestad.pdf

POPULAR ARTICLES

"The Beauty of Physics", article in Norways second largest newspaper Bergens Tidene, Oct 2011, https://www.bt.no/btmeninger/kronikk/i/G0rnq/Vis-oss-fysikkens-skjonnhet