

# Prof. Dr. Frank-Peter Schilling

ZHAW  
CH-8401 Winterthur  
☎ +41 58 934 69 55  
✉ [scik@zhaw.ch](mailto:scik@zhaw.ch)  
🌐 [fpschill.github.io](https://fpschill.github.io)  
in [frankpeterschilling](#)



## Employment

- 2023- **Deputy Director**, *Centre for AI (CAI)*, ZHAW, Winterthur (CH)
- 2022- **Adjunct Professor of Data Science**, *Victoria University of Wellington*, Wellington (NZ)
- 2022- **Senior Lecturer & Group Leader**, ZHAW, Winterthur (CH)  
Head, Intelligent Vision Systems (IVS) group, Centre for AI (CAI); Computer Vision and MLOps
- 2019-2022 **Senior Researcher**, ZHAW, Winterthur (CH)  
Centre for AI (CAI, 2021-); Inst. for Applied Information Technology (InIT, 2019-2021); AI and Deep Learning
- 2018-2019 **Guest Scientist**, *Zurich University of Applied Sciences ZHAW*, Winterthur (CH)  
Institute for Applied Information Technology (InIT); AI/ML, Deep Learning, Computer Vision
- 2016-2018 **CEO**, *fp solutions*, Bern and Winterthur (CH)
- 2007-2015 **Visiting Researcher**, *CERN*, Geneva (CH)  
Permanently delegated from KIT to conduct research at CMS experiment at the LHC
- 2007-2014 **Senior Research Scientist**, *Karlsruhe Institute of Technology KIT*, Karlsruhe (DE)  
Research at the CMS experiment at the Large Hadron Collider LHC
- 2004-2006 **Research Fellow**, *CERN*, Geneva (CH)  
Preparatory work for the LHC and the CMS experiment
- 2001-2004 **Postdoctoral Fellow**, *DESY*, Hamburg (DE)  
Research and data analysis at the H1 experiment at the HERA particle accelerator

## Education & Training

- 2024 **IEEE CertifAIEd Authorized Lead Assessor**, *IEEE SA*
- 2023-2024 **Certificate of Advanced Studies (CAS)**, *University Didactics, PH Zurich*
- 2015 **IPMA Certification in Project Management**, *VZPM*
- 1998-2001 **PhD in Physics (Dr. rer. nat.)**, *University of Heidelberg (DE)*
- 1992-1998 **Diploma in Physics (MSc equiv.)**, *University of Heidelberg (DE)*

## Awards & Publications

- 2013 **EPS HEP Prize**, as member of CMS collaboration at CERN, for the discovery of the Higgs boson
- 1998- **More than 450 scientific publications, h-index of 160**  
For details, see <https://fpschill.github.io/publications/>

## Research Grants

- 2022 "certAlnty", Innosuisse with CertX AG, 600 KCHF
- 2022 "OSR4H", with Roche Diagnostics, 30 KCHF
- 2021 "AC3T", Innosuisse with Varian Medical Systems, 785 KCHF
- 2020 "ANNPR 2020", ZHAW Digital Futures Fund, 10 KCHF
- 2007-2014 Contributor to several research grants for MEUR research group funding with the German BMBF

## Project Management

- 2019- **Project manager**, *Applied Deep Learning*, ZHAW CAI  
Project management for various 3rd party funded research projects in the domain of AI, Deep Learning, Computer Vision and MLOps; Financial planning and reporting; IP contracts
- 2010-2011 **Programme coordinator "Top Quark Physics"**, *CMS experiment*, CERN  
Led 1 out of 7 physics working groups (100+ members) of the collaboration; strategic planning, scheduling and execution of analysis of first LHC data; assessment and quality control; orchestrating of publications; reporting to management

- 2006-2007 **Project leader "Silicon tracker alignment"**, *CMS experiment*, CERN
- 2003-2004 **Trigger coordinator**, *H1 experiment*, DESY
- 2001-2003 **Physics group coordinator**, *H1 experiment*, DESY

## Research Infrastructure

- 2023- **Expert group member**, *Data Ethics, Big Data & AI, data innovation alliance*
- 2022- **Coordinator**, *PhD Programme in Data Science between ZHAW and University of Zurich*
- 2022- **Head**, *Continuing Education, ZHAW Centre for AI*
- 2019- **Main organizer**, *CAI colloquium and Datalab seminar, ZHAW*  
Regular seminars on data science topics with internal and external speakers
- 2019- **Advisory board member**, *Breakout group DIZH fellowships, ZHAW digital*
- 2011-2014 **Co-founder**, *WG on Top Quark Physics at LHC*, LHC Physics Center at CERN (LPCC)  
Transnational group of experts discussing scientific topics at the forefront of research in top quark physics
- 2008-2014 **Coordinator**, *Top Quark Physics WG, Helmholtz Alliance Physics at the Terascale*  
The "Terascale" Alliance bundles German activities in the field of high-energy collider physics.
- 2008-2012 **Advisory board member**, *DESY scientific board (DESY WA)*, DESY  
DESY WA is a committee which advises the DESY directorate in matters of research policy

## Workshop and Conference Organization

- 2021 ISSDS 2021, Intl. Symposium on the Science of Data Science, ZHAW/Online (co-organizer)
- 2020 ANNPR 2020, 9th IAPR Workshop on Artificial NN's in Pattern Recognition, ZHAW/Online (chair)
- 2011, 2012 Helmholtz Alliance workshops on top quark physics, Wuppertal and Berlin (co-organizer)
- 2011 TOP 2011, 4th Intl. workshop on top quark physics, Sant Feliu de Guixols (IAC member)

## Recent Teaching & Student supervision

### Head of studies

- 2023- Creation of new modules: MLOps, Computer Vision with Deep Learning, Generative AI in Teaching, CAS Advanced ML and MLOps
- 2022- Head of studies: MLOps, Computer Vision with Deep Learning, Generative AI in Teaching, CAS Advanced ML and MLOps, CAS Machine Intelligence

### Teaching

- 2024- "MLOps" (BSc and Cont. Education), ZHAW, Spring 2024, Fall 2024
- 2024- "Computer Vision with Deep Learning" (BSc), ZHAW, Spring 2024
- 2022- "Deep Learning" (CAS Machine Intelligence), ZHAW, Fall 2022, 2023, 2024
- 2019- "Artificial Intelligence 1" (BSc), ZHAW, Fall 2019, 2020, 2021, 2022
- 2019 "Machine Intelligence Lab" and "AI Seminar" (MSc), ZHAW, Fall 2019

### Student supervision

- 2001- Supervision of 10 PhD students (AI/ML, computer vision; QCD, Top quark and Higgs physics)
- 2021- Supervision of several MSc/MAS students (AI/ML, computer vision)

## Networks

data innovation alliance, European Physical Society (EPS), German Physical Society (DPG), CLAIRE, ELLIS (supporter), ZHAW Datalab, ZHAW Digital Futures Lab, ZHAW Digital Health Lab

## Journals

Reviewer/PC member for EPIA 2022, CVPR 2022, AutoML 2022, ANNPR 2022, ISSDS 2021, ANNPR 2020  
Reviewer/Guest Editor for MDPI (several), Phys.Lett.B, Eur.Phys.J. C, JHEP, Int.J.Mod.Phys. A

## Languages

German (native); English (business fluent); French (very good)

## Selected Publications

As of September 2024, my **h-index is ca. 160**. The following list contains **only my most important publications**. For a **full list** of my publications, see Google Scholar: <https://scholar.google.com/citations?user=ZgO3g3QAAAAJ>.

1. P. Denzel, S. Brunner, Y. Billeter, O. Forster, C. Frischknecht-Gruber, M. Reif, F.-P. Schilling, J. Weng, R. Chavarriaga, A. Amini, , M. Repetto, and A. Iranfar, "Towards the Certification of AI-based Systems," in *SDS 2024: 11th IEEE Swiss Conference on Data Science*, 2024. doi: 10.21256/zhaw-30439
2. Y. Billeter, P. Denzel, R. Chavarriaga, O. Forster, F.-P. Schilling, S. Brunner, C. Frischknecht-Gruber, M. Reif, and J. Weng, "MLOps as Enabler of Trustworthy AI," in *SDS 2024: 11th IEEE Swiss Conference on Data Science*, 2024. doi: 10.21256/zhaw-30443
3. M. Amirian, D. Barco, I. Herzig, and F.-P. Schilling, "Artifact Reduction in 3D and 4D Cone-beam Computed Tomography Images with Deep Learning - A Review," *IEEE Access*, vol. 12, pp. 10 281–10 295, 2024. doi: 10.1109/ACCESS.2024.3353195
4. P. Denzel, F.-P. Schilling, and E. Gavagnin, "Map-to-map translation for SKA mock observations and cosmological simulations," in *Hammers and Nails 2023 - Swiss Edition, Ascona, Switzerland, October 2023*, 2023. doi: 10.21256/zhaw-29047
5. M. Amirian, J. A. Montoya-Zegarra, I. Herzig, P. E. Hotz, L. Lichtensteiger, M. Morf, A. Züst, P. Paysan, I. Peterlik, S. Scheib, R. M. Fuchslin, T. Stadelmann, and F.-P. Schilling, "Mitigation of motion-induced artefacts in Cone Beam Computed Tomography using Deep Convolutional Neural Networks," *Med. Phys.*, vol. 50, no. 10, pp. 6228–6242, 2023. doi: 10.1002/mp.16405
6. F.-P. Schilling, D. Flumini, R. M. Fuchslin, E. Gavagnin, A. Geller, S. Quarteroni, and T. Stadelmann, "Foundations of Data Science: A Comprehensive Overview Formed at the 1st International Symposium on the Science of Data Science," *Archives of Data Science, Series A*, vol. 8, no. 2, pp. 1 – 20, 2022. doi: 10.5445/IR/1000146422
7. I. Herzig, P. Paysan, S. Scheib, F.-P. Schilling, J. Montoya, M. Amirian, T. Stadelmann, P. Eggenberger, R. M. Fuchslin, and L. Lichtensteiger, "Deep Learning-Based Simultaneous Multi-Phase Deformable Image Registration of Sparse 4D-CBCT," in *Proceedings of the American Association of Physics in Medicine Annual Meeting (AAPM 2022)*, 2022. doi: 10.21256/zhaw-25181 Washington, DC, USA, July 2022
8. N. Simmler, P. Sager, P. Andermatt, R. Chavarriaga, F.-P. Schilling, M. Rosenthal, and T. Stadelmann, "A survey of un-, weakly-, and semi-supervised learning methods for noisy, missing and partial labels in industrial vision applications," in *8th Swiss Conference on Data Science (SDS)*, 2021. doi: 10.1109/SDS51136.2021.00012 pp. 26–31
9. L. Tuggener, M. Amirian, F. Benites, P. von Däniken, P. Gupta, F.-P. Schilling, and T. Stadelmann, "Design Patterns for Resource-Constrained Automated Deep-Learning Methods," *AI*, vol. 1, no. 4, pp. 510–538, 2020. doi: 10.3390/ai1040031
10. F.-P. Schilling and T. Stadelmann, Eds., *Artificial neural networks in pattern recognition : Proceedings of the 9th IAPR TC3 workshop, ANNPR 2020, Winterthur, Switzerland, September 2-4, 2020*, vol. Lecture Notes in Computer Science, no. 12294. Springer, 2020. doi: 10.1007/978-3-030-58309-5
11. M. Amirian, L. Tuggener, R. Chavarriaga, Y. P. Satyawana, F.-P. Schilling, F. Schwenker, and T. Stadelmann, "Two to trust: Automl for safe modelling and interpretable deep learning for robustness," *Proc. of the 1st TAILOR Workshop on Trustworthy AI at ECAI 2020*, 2020. doi: 10.21256/zhaw-22061
12. M. Amirian, K. Rombach, L. Tuggener, F.-P. Schilling, and T. Stadelmann, "Efficient deep cnns for cross-modal automated computer vision under time and space constraints," *Proc. of ECML-PKDD 2019, Würzburg*, 2019. doi: 10.21256/zhaw-18357
13. S. Chatrchyan *et al.*, "Measurement of the mass difference between top quark and antiquark in pp collisions at  $\sqrt{s} = 8$  TeV," *Phys. Lett. B*, vol. 770, pp. 50–71, 2017. doi: 10.1016/j.physletb.2017.04.028
14. S. Chatrchyan *et al.*, "Evidence for the direct decay of the 125 GeV Higgs boson to fermions," *Nature Phys.*, vol. 10, p. 557, 2014. doi: 10.1038/nphys3005

15. S. Chatrchyan *et al.*, “Search for the standard model Higgs boson produced in association with a W or a Z boson and decaying to bottom quarks,” *Phys. Rev.*, vol. D89, p. 012003, 2014. doi: 10.1103/PhysRevD.89.012003
16. S. Chatrchyan *et al.*, “Observation of a new boson with mass near 125 GeV in pp collisions at  $\sqrt{s} = 7$  and 8 TeV,” *JHEP*, vol. 1306, p. 081, 2013. doi: 10.1007/JHEP06(2013)081
17. S. Chatrchyan *et al.*, “Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC,” *Phys.Lett.*, vol. B716, pp. 30–61, 2012. doi: 10.1016/j.physletb.2012.08.021
18. F.-P. Schilling, “Top Quark Physics at the LHC: A Review of the First Two Years,” *Int. J. Mod. Phys.*, vol. A27, no. 17, p. 1230016, 2012. doi: 10.1142/s0217751x12300165
19. S. Chatrchyan *et al.*, “Measurement of the single-top-quark  $t$ -channel cross section in  $pp$  collisions at  $\sqrt{s} = 7$  TeV,” *JHEP*, vol. 1212, p. 035, 2012. doi: 10.1007/JHEP12(2012)035
20. S. Chatrchyan *et al.*, “Inclusive and differential measurements of the  $t\bar{t}$  charge asymmetry in proton-proton collisions at 7 TeV,” *Phys.Lett.*, vol. B717, pp. 129–150, 2012. doi: 10.1016/j.physletb.2012.09.028
21. S. Chatrchyan *et al.*, “Measurement of the  $t\bar{t}$  Production Cross Section in pp Collisions at 7 TeV in Lepton + Jets Events Using b-quark Jet Identification,” *Phys.Rev.*, vol. D84, p. 092004, 2011. doi: 10.1103/PhysRevD.84.092004
22. S. Chatrchyan *et al.*, “Measurement of the  $t\bar{t}$  production cross section and the top quark mass in the dilepton channel in pp collisions at  $\sqrt{s} = 7$  TeV,” *JHEP*, vol. 07, p. 049, 2011. doi: 10.1007/JHEP07(2011)049
23. S. Chatrchyan *et al.*, “Measurement of the Top-antitop Production Cross Section in pp Collisions at  $\sqrt{s} = 7$  TeV using the Kinematic Properties of Events with Leptons and Jets,” *Eur. Phys. J.*, vol. C71, p. 1721, 2011. doi: 10.1140/epjc/s10052-011-1721-3
24. V. Khachatryan *et al.*, “First Measurement of the Cross Section for Top-Quark Pair Production in Proton-Proton Collisions at  $\sqrt{s} = 7$  TeV,” *Phys.Lett.*, vol. B695, pp. 424–443, 2011. doi: 10.1016/j.physletb.2010.11.058
25. F.-P. Schilling, “Top Quark Studies with the first CMS Data,” in *21st Hadron Collider Physics Symposium, Toronto, Canada*, 2010. doi: 10.48550/arXiv.1010.2393 arXiv:1010.2393
26. F.-P. Schilling, “QCD and Top Quark Physics at the LHC,” in *4th Intl. Conference on Physics at the LHC, Split, Croatia*, vol. LHC2008, 2008. doi: 10.22323/1.055.0047 p. 047
27. R. Adolphi *et al.*, “The CMS experiment at the CERN LHC,” *JINST*, vol. 3, p. S08004, 2008. doi: 10.1088/1748-0221/3/08/S08004
28. G. Bayatian *et al.*, “CMS technical design report, volume II: Physics performance,” *J. Phys.*, vol. G34, pp. 995–1579, 2007. doi: 10.1088/0954-3899/34/6/S01
29. A. Aktas *et al.*, “Measurement and QCD analysis of the diffractive deep- inelastic scattering cross-section at HERA,” *Eur. Phys. J.*, vol. C48, pp. 715–748, 2006. doi: 10.1140/epjc/s10052-006-0035-3
30. A. Aktas *et al.*, “Diffractive deep-inelastic scattering with a leading proton at HERA,” *Eur. Phys. J.*, vol. C48, pp. 749–766, 2006. doi: 10.1140/epjc/s10052-006-0046-0
31. A. Bruni, M. Diehl, and F.-P. Schilling, “Summary of working group B: Diffraction and vector mesons,” in *12th Intl. Workshop on Deep Inelastic Scattering (DIS 2004), Slovakia (DESY-04-201)*, 2004. doi: 10.48550/arXiv.hep-ph/0410106 Preprint arXiv:hep-ph/0410106
32. F.-P. Schilling, “Diffractive final states with the H1 detector at HERA,” in *Intl. Europhysics Conference on High-Energy Physics (EPS-HEP 2003), Aachen, Germany*, vol. C33, 2004. doi: 10.1140/epjcd/s2004-03-1680-9 pp. s530–s532
33. F.-P. Schilling, “Inclusive diffraction at HERA,” in *31st Intl. Conference on High Energy Physics (ICHEP 2002), Amsterdam, The Netherlands*, vol. 117, 2003. doi: 10.1016/S0920-5632(03)90578-0 pp. 403–407
34. C. Adloff *et al.*, “Diffractive jet production in deep inelastic  $e^+p$  collisions at HERA,” *Eur. Phys. J.*, vol. C20, pp. 29–49, 2001. doi: 10.1007/s100520100634
35. F.-P. Schilling, “Diffractive dijet production at HERA,” in *7th Intl. Workshop on Deep Inelastic Scattering (DIS 1999), Zeuthen, Germany*, vol. 79, 1999. doi: 10.1016/S0920-5632(99)00700-8 pp. 287–289