Sven Kreiss, PhD

e-mail: me@svenkreiss.com , GitHub: svenkreiss, Twitter: svenkreiss

Machine learning researcher with a focus on computer vision and social robots.
Statistical modeling expert; was on the core team that discovered the Higgs Boson at CERN.
Founder of the New York City Data Breakfast.
Creator of `pysparkling` and `Databench`; see GitHub: https://github.com/svenkreiss.
Preferred programming environments: PyTorch, Python, C++, TypeScript/JavaScript, Spark, React
Languages: English (fluent), German (native), French (basic)
Grew up in Germany, studied and lived in the UK, Switzerland and the US.

Experience

EPFL, Visual Intelligence for Transportation, Lausanne — started in April 2018
Postdoc, Computer Vision research for social robots and self-driving cars.
Projects: Multi-person pose estimation (*CVPR2019*). Crowd-Robot Interaction with deep reinforcement learning (*ICRA2019*). Monocular depth estimation of pedestrians. Visual similarity for retrieval tasks. Automatic differentiation in Social Force models.

Sidewalk Labs, an Alphabet company, New York City — April 2016 – March 2018
Senior Data Scientist April 2017 – March 2018, Data Scientist April 2016 – April 2017
2nd engineer. Conducted a lot of technical recruiting interviews.
Machine Learning and Computer Vision expert.
Predictive modeling for our spinnout company *Coord* that focuses on transportation coordination.
Created geospatial tools and analyses for the urban policy team.
Wrote the first technical blog post on better digital map tools for cities.

Wildcard, New York City — Sept 2014 – March 2016
Lead Data Scientist
Developed a machine learning tool for text and media extraction from HTML documents.
Created a content recommendation engine with Collaborative Filtering on Spark with a particular focus on the cold start problem.
Supervised three innhouse analysts who generated training datasets.

Education

New York University, New York City — Sept 2009 – May 2014
Doctor of Philosophy
Thesis: Higgs Boson Discovery and First Property Measurements using the ATLAS Detector
Award: NSF LHC Student Support Award for a oneyearnstay at CERN in Geneva, Switzerland

University of Edinburgh, UK — Sept 2005 – Sept 2009
Master of Physics with Honors in Mathematical Physics, Bachelor of Science
Thesis: New Physics at the LHC: Distinguishability of Supersymmetry and Little Higgs models

Software

s2sphere, a Python implementation of the S2 geometry library. — April 2016
Github: https://github.com/sidewalklabs/s2sphere

pysparkling, a native Python implementation of Spark's RDD interface. — May 2015
Github: https://github.com/svenkreiss/pysparkling

Databench, an interactive realtime data analysis tool. — June 2014
Github: https://github.com/svenkreiss/databench

Talks and Conferences

ICISTS conference, KAIST, South Korea — July 2018
Invited expert speaker on Geospatial Data in Future Cities.

Columbia University, New York City — Dec 2017
Guest lecture in the Master of Data Science program on Geospatial Data Science.

Data for Good Exchange, Bloomberg, New York City — Sept 2017
Program committee member.

Strata+Hadoop World, New York City — Oct 2015
Databench for interactive data analyses.

MLconf, Atlanta — Sept 2015
Conference talk on Deep ML Architecture at Wildcard.

Betaworks Studio and Radius Intelligence, New York City and San Francisco — May 2015, March 2016
Talk on Data and the Higgs Boson Discovery.

University of Cambridge, UK — Jan 2014
Seminar on Factorizing Theoretical Uncertainties from LHC Higgs Coupling Measurements.

Statistical and Applied Mathematical Sciences Institute (SAMSI), Durham, NC, USA — July 2013
Talk on Modeling and Statistical Analysis for Higgs Physics at the Large Hadron Collider at the workshop on Knowledge Extraction via Comparison of Complex Computational Models to Massive Data Sets.

CERN, Switzerland — Jan 2013
Talk on the $H \to ZZ^* \to 4l$ Likelihood in ATLAS at the workshop on Likelihoods for the LHC Searches.

LHC Days 2012, Split, Croatia — Oct 2012
Talk on Standard Model Higgs Combination and Properties.

Computing in High Energy and Nuclear Physics (CHEP), New York City — May 2012
Talk on RooStats: Statistical Tools for the LHC.

Publications

As a former member of the ATLAS collaboration, I am a coauthor of over 340 published papers which are listed on my author page on inspirehep.net and Google Scholar. The list below only contains publications where I made a significant contribution to the paper:

[1] Sven Kreiss, Lorenzo Bertoni, and Alexandre Alahi. "PifPaf: Composite Fields for Human Pose Estimation". In: *CVPR* (Mar. 2019).

[2] George Adaimi, Sven Kreiss, and Alexandre Alahi. "A Simple Yet Effective Baseline for Visual Similarity". In: *submitted to hEART conference* (Feb. 2019).

[3] Sven Kreiss and Alexandre Alahi. "Automatic Differentiation in Social Force Models". In: *submitted to hEART conference* (Feb. 2019).

[4] Sven Kreiss and Alexandre Alahi. "Next Steps for Social Force with Big Data". In: *submitted to STRC conference* (Feb. 2019).

[5] Changan Chen et al. "Crowd-Robot Interaction: Crowd-aware Robot Navigation with Attention-based Deep Reinforcement Learning". In: *ICRA, arXiv preprint arXiv:1809.08835* (2018).

[6] Georges Aad et al. "Combined Measurement of the Higgs Boson Mass in pp Collisions at $\sqrt{s} = 7$ and 8 TeV with the ATLAS and CMS Experiments". In: *Physical review letters* 114.19 (2015), p. 191803.

[7] Georges Aad et al. "Measurements of Higgs boson production and couplings in the four-lepton channel in pp collisions at center-of-mass energies of 7 and 8 TeV with the ATLAS detector". In: *Physical Review D* 91.1 (2015), p. 012006.

[8] Georges Aad et al. "Observation and measurement of Higgs boson decays to WW^* with the ATLAS detector". In: *Physical Review D* 92.1 (2015), p. 012006.

[9] Kyle Cranmer et al. "Decoupling theoretical uncertainties from measurements of the Higgs boson". In: *Physical Review D* 91.5 (2015), p. 054032.

[10] ATLAS collaboration et al. "Measurement of the Higgs boson mass from the $H \to \gamma\gamma$ and $H \to ZZ^* \to 4l$ channels with the ATLAS detector using 25 fb^{-1} of pp collision data". In: *Physical Review D* 90.5 (2014), pp. 052004–1.

[11] Christian Gumpert et al. "Software for statistical data analysis used in Higgs searches". In: *Journal of Physics: Conference Series*. Vol. 490. 1. IOP Publishing. 2014, p. 012229.

[12] Sven Kreiss. "Higgs Boson Discovery and First Property Measurements using the ATLAS Detector". PhD thesis. New York University, 2014.

[13] Georges Aad et al. "Evidence for the spin-0 nature of the Higgs boson using ATLAS data". In: *Physics Letters B* 726.1-3 (2013), pp. 120–144.

[14] ATLAS collaboration et al. "Measurements of Higgs boson production and couplings in diboson final states with the ATLAS detector at the LHC". In: *Physics Letters B* 726.1 (2013), pp. 88–119.

[15] Georges Aad et al. "Combined search for the Standard Model Higgs boson in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector". In: *Physical Review D* 86.3 (2012), p. 032003.

[16] Georges Aad et al. "Combined search for the Standard Model Higgs boson using up to 4.9 fb^{-1} of pp collision data at $\sqrt{s} = 7$ TeV with the ATLAS detector at the LHC". In: *Physics Letters B* 710.1 (2012), pp. 49–66.

[17] Georges Aad et al. "Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC". In: *Physics Letters B* 716.1 (2012), pp. 1–29.

[18] Georges Aad et al. "Performance of the ATLAS Trigger System in 2010". In: *The European Physical Journal C* 72.1 (2012), p. 1849.

[19] Georges Aad et al. "Search for the Standard Model Higgs boson in the decay channel $H \to ZZ^* \to 4l$ with 4.8 fb^{-1} of pp collision data at $\sqrt{s} = 7$ TeV with ATLAS". In: *Physics Letters B* 710.3 (2012), pp. 383–402.

[20] Georges Aad et al. "Search for the Standard Model Higgs boson in the H $\to WW^{(*)} \to l\nu l\nu$ decay mode with 4.7 fb^{-1} of ATLAS data at $\sqrt{s} = 7$ TeV". In: *Physics Letters B* 716.1 (2012), pp. 62–81.

[21] G Brooijmans et al. "Les Houches 2011: physics at TeV colliders new physics working group report". In: *arXiv preprint arXiv:1203.1488* (2012).

[22] Atlas Collaboration et al. "A particle consistent with the Higgs boson observed with the ATLAS detector at the Large Hadron Collider". In: *Science* 338.6114 (2012), pp. 1576–1582.

[23] Sven Kreiss. *Standard Model Higgs Combination and Properties*. Tech. rep. ATL-COM-PHYS-2012-1412, 2012.

[24] Atlas Collaboration et al. *Procedure for the LHC Higgs boson search combination in summer 2011*. Tech. rep. ATL-PHYS-PUB-2011-011, 2011.

[25] Vasiliki Mitsou et al. "Measurement of the top quark-pair production cross section with ATLAS in pp collisions at $\sqrt{s} = 7$ TeV". In: *European Physical Journal C, 2011, vol. 71, num. 3-1577, p. 1-36* (2011).

[26] L Moneta et al. "The RooStats Project". In: *PoS ACAT2010* 057 (2010).

[27] Benjamin C Allanach et al. "SUSY Les Houches Accord 2". In: *Computer Physics Communications* 180.1 (2009), pp. 8–25.

[28] Georges Aad et al. "The ATLAS experiment at the CERN large hadron collider". In: *Journal of Instrumentation* 3.8 (2008), S08003–S08003.

[29] M Alexander et al. "Physics beyond the standard model: Supersymmetry". In: *Workshop on "Physics at TeV colliders"*. 2008, pp. 291–361.