

# SVEN KREISS, PHD

e-mail: [me@svenkreiss.com](mailto:me@svenkreiss.com) , GitHub: [svenkreiss](https://github.com/svenkreiss), Twitter: [svenkreiss](https://twitter.com/svenkreiss)

Researcher with a focus on Computer Vision and Machine Learning.

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, TensorFlow, 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 ambient intelligence and intelligent agents.

Crowd-Robot Interaction with Deep Reinforcement Learning.

**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 spinout company *Coord* that focuses on transportation coordination.

Geospatial tools and analyses for Sidewalk's Policy team.

Wrote the first Sidewalk Talk 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 inhouse 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 oneyearstay 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

<b>ICISTS conference, KAIST</b> , South Korea Invited expert speaker on Geospatial Data in Future Cities.	July 2018
<b>Columbia University</b> , New York City Guest lecture in the Master of Data Science program on Geospatial Data Science.	Dec 2017
<b>Data for Good Exchange, Bloomberg</b> , New York City Program committee member.	Sept 2017
<b>Strata+Hadoop World</b> , New York City Databench for interactive data analyses.	Oct 2015
<b>MLconf</b> , Atlanta Conference talk on Deep ML Architecture at Wildcard.	Sept 2015
<b>Betaworks Studio and Radius Intelligence</b> , New York and San Francisco Talk on Data and the Higgs Boson Discovery.	May 2015, March 2016
<b>University of Cambridge</b> , UK Seminar on Factorizing Theoretical Uncertainties from LHC Higgs Coupling Measurements.	Jan 2014
<b>Statistical and Applied Mathematical Sciences Institute (SAMSI)</b> , Durham, NC 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.	July 2013
<b>CERN</b> , Switzerland Talk on the $H \rightarrow ZZ^* \rightarrow 4l$ Likelihood in ATLAS at the workshop on Likelihoods for the LHC Searches.	Jan 2013
<b>LHC Days 2012</b> , Split, Croatia Talk on Standard Model Higgs Combination and Properties.	Oct 2012
<b>Computing in High Energy and Nuclear Physics (CHEP)</b> , New York City Talk on RooStats: Statistical Tools for the LHC.	May 2012

## 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](https://inspirehep.net) and [Google Scholar](https://scholar.google.com/). The list below only contains publications where I made a significant contribution to the paper:

- [1] C. Chen et al. “Crowd-Robot Interaction: Crowd-aware Robot Navigation with Attention-based Deep Reinforcement Learning”. In: *ArXiv: cs.RO/1809.08835* (Sept. 2018).
- [2] 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.
- [3] 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.
- [4] 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.
- [5] Kyle Cranmer et al. “Decoupling theoretical uncertainties from measurements of the Higgs boson”. In: *Physical Review D* 91.5 (2015), p. 054032.
- [6] ATLAS collaboration et al. “Measurement of the Higgs boson mass from the  $H \rightarrow \gamma\gamma$  and  $H \rightarrow ZZ^* \rightarrow 4l$  channels with the ATLAS detector using 25 fb<sup>-1</sup> of  $pp$  collision data”. In: *Physical Review D* 90.5 (2014), pp. 052004–1.
- [7] 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.

- [8] Sven Kreiss. “Higgs Boson Discovery and First Property Measurements using the ATLAS Detector”. PhD thesis. New York University, 2014.
- [9] 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.
- [10] 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.
- [11] 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.
- [12] Georges Aad et al. “Combined search for the Standard Model Higgs boson using up to  $4.9 \text{ fb}^{-1}$  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.
- [13] 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.
- [14] Georges Aad et al. “Performance of the ATLAS Trigger System in 2010”. In: *The European Physical Journal C* 72.1 (2012), p. 1849.
- [15] Georges Aad et al. “Search for the Standard Model Higgs boson in the decay channel  $H \rightarrow ZZ^* \rightarrow 4l$  with  $4.8 \text{ fb}^{-1}$  of  $pp$  collision data at  $\sqrt{s} = 7$  TeV with ATLAS”. In: *Physics Letters B* 710.3 (2012), pp. 383–402.
- [16] Georges Aad et al. “Search for the Standard Model Higgs boson in the  $H \rightarrow WW^{(*)} \rightarrow l\nu l\nu$  decay mode with  $4.7 \text{ fb}^{-1}$  of ATLAS data at  $\sqrt{s} = 7$  TeV”. In: *Physics Letters B* 716.1 (2012), pp. 62–81.
- [17] G Brooijmans et al. “Les Houches 2011: physics at TeV colliders new physics working group report”. In: *arXiv preprint arXiv:1203.1488* (2012).
- [18] 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.
- [19] Sven Kreiss. *Standard Model Higgs Combination and Properties*. Tech. rep. ATL-COM-PHYS-2012-1412, 2012.
- [20] Atlas Collaboration et al. *Procedure for the LHC Higgs boson search combination in summer 2011*. Tech. rep. ATL-PHYS-PUB-2011-011, 2011.
- [21] 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).
- [22] L Moneta et al. “The RooStats Project”. In: *PoS ACAT2010* 057 (2010).
- [23] Benjamin C Allanach et al. “SUSY Les Houches Accord 2”. In: *Computer Physics Communications* 180.1 (2009), pp. 8–25.
- [24] Georges Aad et al. “The ATLAS experiment at the CERN large hadron collider”. In: *Journal of Instrumentation* 3.8 (2008), S08003–S08003.
- [25] M Alexander et al. “Physics beyond the standard model: Supersymmetry”. In: *Workshop on "Physics at TeV colliders"*. 2008, pp. 291–361.