(647) 671-3764
Toronto, ON
(Relocation Flexible)

Yi Fei Han

Physicist / Data Scientist

Google Scholar
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Skills

Tools and Languages	C++, Python, Git, LaTeX, Valgrind
Distributed Computing	HTCondor, Linux, Rucio, AWS, Docker
Quantitative Research	Probability Modelling, ROOT, ROOFIT
Communication	English (native), Chinese (native), Japanese (fluent)

Technical Experience

Researcher - Data Analysis **Sept 2017 —**
ATLAS Experiment | CERN *Toronto, Canada*

ATLAS is a general-purpose particle physics experiment at the Large Hadron Collider at CERN designed to answer questions about the fundamental forces of nature. As of 2022, it has over 5000 collaborating members from 181 institutions in 42 countries.

- Collaborate in a large experiment with over 5000 members and 3000 authored scientists
- Apply cuts to data sets according to the underlying physics to define phase spaces where the desired signal is enhanced
- Calibrate different data objects with both traditional and machine-learning based approaches to correct for biases and errors introduced in the data-taking process
- Skim data sets for final analysis use over distributed computing resources, from 1000+ TB to less than 10 GB
- Correct for various mis-modelling in physics simulation with data-driven methods like ABCD extrapolation
- Train and use recursive neural networks as the discriminant for signal separation
- Perform likelihood maximization on a probability model with 3 observed data sets and 100+ nuisance parameters

Developer - Detector Simulation **Aug 2017 – Sept 2021**
ATLAS Experiment | CERN *Toronto, Canada*

- Use multi-thread physics engines to simulate detector response to charged particles
- Build interface between in-house software framework and third-party physics libraries
- Optimize physics simulation time with a library of pre-processed detector responses as a function of input parameters
- Validate physics simulation accuracy for each detector component by comparing a high- and low-level output variables

Teaching Assistant **Sept 2016 — Sept 2021**
University of Toronto *Toronto, Canada*

- Run weekly tutorials and host office hours for undergraduate physics courses
- Grade lab reports, essays, assignments and exams, for classes of up to 150 students
- Topics taught include mechanics, electromagnetism, quantum mechanics, and relativity

Education

PhD in Physics, *University of Toronto* 2022
Bachelor of Science in Physics and Mathematics, *University of California, Los Angeles* June 2016

Select Publications

As an ATLAS author, I have my name on every published ATLAS paper. I contributed significantly to these following publications:

ATLAS Collaboration, *Measurement of fiducial and differential W^+W^- production cross-sections at $\sqrt{s} = 13$ TeV with the ATLAS detector.* The European Physical Journal C, 79(10), Oct 2019. arXiv:1905.04242[hep-ex]

ATLAS Collaboration, *Search for electroweak diboson production in association with a high-mass dijet system in semileptonic final states in pp collisions at $\sqrt{s} = 13\mathrm{TeV}$ with the ATLAS detector.* Phys. Rev. D 100, 032007. arXiv:1905.04242 [hep-ex]

ATLAS Collaboration, *The Fast Simulation Chain in the ATLAS experiment.* EPJ Web Conf. 251 03012 (2021). DOI: 10.1051/epjconf/202125103012

Hobbies

- Music production: making original music and music videos since 2018, with works published on SoundCloud and bilibili.tv
- Gaming: board game and table-top RPG enthusiast, dungeon master in a home Dungeons & Dragons game