QICHEN DONG

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WORK EXPERIENCE

University of Oxford April 2025 - Present
Postdoctoral Research Associate *Geneva, CH*

- Supervised by Prof. Chris Hays.
- Recipient of an ATLAS machine learning (ML) Software Development Grant to enhance inference performance.
- Leading development of the ATLAS boosted di-τ_{had} trigger for the 2025 LHC run.
- Designed and deployed real-time di-τ_{had} trigger algorithms, enhancing signal selection efficiency and background estimation.
- Key analyst on the ATLAS Run 2+3 boosted $H \to \tau_{\mathrm{had}}\tau_{\mathrm{had}}$ search: trigger optimisation, signal extraction, and beyond-Standard-Model interpretation.
- Developer of the lepton-removal τ_{had} reconstruction for the $H \to aa \to \mu\mu\tau_{\mu}\tau_{\mathrm{had}}$ analysis, including calibration and performance validation.
- Co-supervise two summer students: one developing trigger monitoring algorithms and one supporting the interpretation of the boosted $H \to \tau_{\mathrm{had}}\tau_{\mathrm{had}}$ analysis.

Qube Research and Technology Aug 2022 - Feb 2023
Intern Quantitative Researcher *London, UK*

- Applied natural language processing (NLP) ML models for company similarity analysis on 10-Q/10-K filings and performed sentiment analysis on Japanese local financial reports.
- Developed ML algorithms for financial time-series anomaly detection and corporate-event price correction; optimised real-time market data pipelines.
- Secured a return offer for a permanent quantitative researcher position.

University of Manchester Sep 2020 - Sep 2023
Graduate Teaching Assistant *Manchester, UK*

- Assisted C++ and Python lab sessions for 2nd- and 3rd-year physics undergraduates.
- Supported 3rd-year particle physics experiments, guiding students through data analysis.
- Created interactive Python animations of electromagnetic fields and radiation for the electrodynamics course – used in lectures and distributed for student customisation.

EDUCATION

University of Manchester September 2020 - February 2025
PhD in Particle Physics *Manchester, UK*

- Earned one first-author publication with several more in preparation.

University of Manchester September 2018 - June 2020
Master of Physics *Manchester, UK*

- First-Class Honours; Ranked 30th out of 150 in the final year.

Shandong University September 2015 - June 2018
BSc Physics *Jinan, CN*

- GPA: 83.3; core physics courses GPA: 88.6.

RESEARCH EXPERIENCE

ATLAS experiment, CERN May 2025 - Present
ATLAS Software Development Grant – AI Inference *Geneva, CH*

- Spearheading a six-month AI initiative to optimise ATLAS ML inference pipelines.
- Consolidating and standardising diverse ML models from multiple sub-groups into a unified Athena (the ATLAS offline software framework) inference framework.
- Exploring initial integration of NVIDIA Triton inference server within Athena to assess potential improvements in inference throughput and scalability.

University of Manchester September 2020 - September 2024
PhD Projects *Manchester, UK*

- Supervised by Prof. Terry Wyatt FRS.
- Proposed, developed, implemented, and tested improved methods to identify the highly boosted pair production of the τ leptons in the lep-had channels – the electron-removal τ_{had} and the muon-removal τ_{had} reconstruction applied in Athena.
- Algorithms went through strict scrutiny, now running in Tier-0 ATLAS data processing system. These methods have been adopted by the ATLAS collaboration as the recommanded taggers for boosted $\tau_{\mathrm{lep}}\tau_{\mathrm{had}}$ identification.
- The muon-removal τ_{had} technique has been benchmarked with data, achieving a three- to five-fold improvement in the signal efficiency and signal-to-background ratio. Paper published by EPJC.
- Single-handedly performed a search for resonant production of Higgs boson pairs in the highly boosted $bb\tau\tau$ channel.
- Member of the Run 2+3 $H \rightarrow aa \rightarrow \mu\mu\tau_{\mu}\tau_{\mathrm{had}}$ analysis, which uses the lepton-removal τ_{had} reconstruction as a key ingredient.
- Two papers based on my PhD research are scheduled for publication with the ATLAS Collaboration; I am the primary author.
- Presented the TauCP group summary talk at the ATLAS 30th birthday week, 2022, Lisbon.
- Expert reviewer for the ATLAS Run 2 $H \rightarrow aa \rightarrow 4\tau$ analysis.

ATLAS experiment, CERN April 2022 - August 2022
Long-term-attached PhD student. *Geneva, CH*

- Developer and reviewer for Athena, the ATLAS offline software.
- Senior shifter in the ATLAS software merge requests review team.

VOLUNTEER & LEADERSHIP EXPERIENCE

Gasala, Remote Village June 2016 - September 2017
Volunteer Primary School Teacher *Sichuan, CN*

- Led a team of volunteers.
- Organised math and science lessons for school-age children.

Shandong University September 2015 - June 2017
Associate Lead of Student Union *Jinan, CN*

- Organised voluntary activities for the university.
- Led a team of student representatives.

SKILLS & INTERESTS

Programming	Proficient in programming with C/C++ and Python
Data related	Machine learning, big data analysis, statistical analysis
Teamwork	Strong communication skills in highly collaborative environments
Languages	Chinese (Native), English (Full Professional Proficiency)
Interests	Graphic design, accelarated / distributed computing

PUBLICATIONS

As a member of the ATLAS Collaboration, I have co-authored over 300 peer-reviewed articles since 2022, contributing to all stages of the experimental program—from advanced data analysis techniques and detector performance studies to the development and optimization of cutting-edge methodologies. My efforts have been integral to several high-impact results, enhancing the collaboration's scientific output. A complete list of my publications is available on InspireHEP.

Publications (Major Contributions)

[1] ATLAS Collaboration, *Improved reconstruction of highly boosted τ-lepton pairs in the $\tau\tau \to (\mu\nu_\mu\nu_\tau)(\mathrm{hadrons} + \nu_\tau)$ decay channels with the ATLAS detector*, (2024), arXiv: 2412.14937 [hep-ex].

[2] ATLAS Collaboration, *Search for Higgs boson exotic decays into Lorentz-boosted light bosons in the four-τ final state at $\sqrt{s} = 13\,\mathrm{TeV}$ with the ATLAS detector*, (2025), arXiv: 2503.05463 [hep-ex].

PhD Thesis

[3] Qichen Dong, *Novel Boosted $\tau_{\mathrm{lep}}\tau_{\mathrm{had}}$ Reconstruction Techniques for TeV-Scale Graviton Search in $HH \to b\bar{b}\tau_\mu\tau_{\mathrm{had}}$ Channel with the ATLAS Detector*, PhD thesis: Manchester U, Manchester U., 2025-02-11, 2024.