Ziheng Chen

PhD Candidate in Experimental High Energy Physics

EDUCATION

2015-Now **Northwestern University**, Ph.D, Chicago, US.
High Energy Physics. Statistical Data Analysis. (expect to graduate in Fall 2020)

2011-2015 **Lanzhou University**, B.Sc., Lanzhou, China.
Physics. (graduate with honor)

Additional Education

2014 Summer **Stanford University**, Summer Quarter, Palo Alto, US.
Computer Graphics, Robotics. (fellowship from China Top undergraduate Training Program)

2013-2014 **Royal Holloway University of London**, Undergrad Study Oversea, London, UK.
Physics. (fellowship from Chinese Scholarship Council)

WORKING EXPERIENCE

2017 **Canon Medical**, CT Reconstruction Intern, Chicago, US.
- Develop image reconstruction and correction algorithms for medical computed tomography (CT) scanners.
- Use Monte Carlo simulation to estimate the radiation distribution.

RESEARCH EXPERIENCE

2017-Now **Northwestern University**, Chicago, US.
Statistical analysis (PhD thesis): parameter estimation and hypothesis test with highly-parameterized statistical models. Estimate $Br(W \to l\nu)$ and test the lepton universality hypothesis using data from the Large Hadron Collider (LHC) collected by the CMS detector. It is the world's first hypothesis test of the lepton universality in the weak interaction based on the LHC data. Tools include PyTorch, Scipy, Pandas, matplotlib.

2017 and 2019 **European Organization for Nuclear Research (CERN)**, Geneva, Switzerland.
- Invent new GPU-based clustering algorithms for the reconstruction of the future imaging energy detector.
- Train and deploy deep learning models (RNN, CNN) for particle identification in the imaging energy detector.
- Develop a C++-based data acquisition and monitoring system for the testbeam experiment of a new Si-sensor.

2019 Spring **Deutsches Elektronen-Synchrotron (DESY)**, Hamburg, Germany.
- Use the DESY electron beam to test the new Si-sensor designed for the CMS detector upgrade.
- Data analysis. Use regression to extract the performance of Si-sensor from the experimental data.

2015-2016 **Fermilab**, Chicago, US.
Monte Carlo simulation of electrons in the magnetic field of Mu2E detector.

2015 Spring **Thomas Jefferson National Accelerator Facility (JLab)**, Newport News, US.
Implement C++-based Monte Carlo event generator for deep inelastic scattering process.

SKILLS

Programming: **Python** [5yr], **C++** [5yr], **CUDA** [3yr], **OpenCL** [1yr], **Swift** [1yr]
Analysis: **PyTorch** [3yr], **Numpy/Scipy/Pandas/Scikit-Learn** [5yr], **Plotly/Matplotlib** [5yr]
Extra: **Github** [5yr], **Linux shell** [5yr], **iOS App/CoreML/ARKit** [1yr]
Knowledge: Statistics, Machine Learning (ML), Deep Learning (DL), Natural Language Processing (NLP)

SELECTED SIDE PROJECTS [Gallery]

Artimo (2017) [DL,CV,iOS] An iOS App for On-Device Deep Neural Photo-Stylization with augmented reality. video web

CLUE (2019) [ML,GPU] A New Fast Clustering Algorithm on GPU. github

Nexpil (2020) [CV,NLP] Extract text medical information from videos in the backend of Nexpil, a startup company in medical information management.

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