Xiandong Zhao

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EDUCATION

Post PhD Graduate Certificate in Medical Physics (CAMPEP-Accredited) **May 2021**
Washington University School of Medicine in St. Louis, St. Louis, MO, USA

Ph.D. in Particle Physics Aug. 2017
Southern Methodist University (SMU), Dallas, TX, USA

B.S. in Physics
University of Science and Technology of China (USTC), Hefei, China May 2011

TECHNIQUES AND SKILLS

- Programming: C/C++, Python, Java, MySQL, HTML, JavaScript, CSS, SHELL script in Linux
- ML libraries: Keras, TensorFlow, Scikit-Learn, Pytorch
- MC Tools: Geant4, TOPAS, GATE
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WORK EXPERIENCE

- **Postdoctoral Research Associate** at Washington University in St. Louis Jan 2019 – Present
  - ✓ Developing the Geant4-DNA simulation framework and data processing workflow, to model the physical and chemical interactions that are involved in nanomaterial-mediated radiation sensitization.
  - ✓ Developing the single cell model simulation framework to model the radiation-induced DNA damage.
  - ✓ Developing the dose prediction processing by using Neural Networks for breast cancer.
  - ✓ Have Monte Carlo simulation for the preclinical study of proton FLASH irradiation using a synchrocyclotron, as the secondary check for the measurement.

- **Clinical Physics Assistant** at Texas Center for Proton Therapy Feb 2018 – Oct 2018
  - ✓ Developed an Artificial Neural Network model for dose distributions by Python (TensorFlow), to predict the radiotherapy treatment that should be approved by experienced physicians.
  - ✓ Perform patient-specific Quality Assurance (QA) including validation of dose distributions, beam output measurement, and treatment device mechanical QA for all treatment modalities.

- **Postdoctoral Fellow** at Southern Methodist University Sep 2017 – Feb 2018
  - ✓ Developed the central main analysis code to produce the data and histograms of systematic variations in Python environment, got the plots in different model at 95% confidence limits.
  - ✓ Help Texas Center for Proton Therapy to improve the proton therapy simulation, increasing the spatial accuracy. Built the simulation package based on C++ in Geant4.
  - ✓ Work as R&D manager for the educational instrument of Rutherford scattering experiment. Designed the alignment system and vacuum chamber for the instrument.

- **Physics Data Analyst** in ATLAS experiment at CERN (Switzerland) Jan 2015 – June 2016
  - ✓ Developed a leptons momentum reweighting method and cut the systematic uncertainty by 50%.
  - ✓ Implemented and maintained a common data analysis framework using C++ for 5+ new physics search analyses.
  - ✓ Analyzed the real data in ATLAS experiment, found the maximum deviation at heavy Higgs boson signal with 1.9 σ.

- **Research Assistant** at Southern Methodist University June 2013 – Aug 2017
  - ✓ Carried out Monte Carlo simulation for ATLAS, analyzed hundreds of gigabytes simulation data with C++ and Linux Shell programming to study the Heavy Higgs Mechanisms.
  - ✓ Electromagnetic and thermal simulations by ANSYS on the electronic chips for ATLAS experiment.
  - ✓ Designed a miniature dual channel optical latch by PTC Creo and SolidWorks, and managed its production process from 3D printing to injection molding.

AWARDS

- Lightner-Sams Graduate Fellowship at Southern Methodist University (2015)
- Research Day Award of Southern Methodist University (2014)
- Research Day Award of Southern Methodist University (2013)
- Outstanding Teaching Assistant Award of Southern Methodist University (2012)
- Outstanding China Youth Volunteer at University of Science and Technology of China (2008)
- Outstanding Freshman Scholarship at University of Science and Technology of China (2007)

SELECTED PUBLICATIONS

1. **Xiandong Zhao,** Ruirui Liu, Tianyu Zhao, Francisco J. Reynoso. Modeling gold nanoparticle radiosensitization from direct and indirect action in a complete human genome single cell model in Geant4. (submitted).
2. **Xiandong Zhao,** Ruirui Liu, Tianyu Zhao, Francisco J. Reynoso. Modeling double-strand breaks from direct and indirect action in a complete human genome single cell Geant4 model. Biomedical Physics & Engineering Express. 2020.
3. Ruirui Liu, Tianyu Zhao, **Xiandong Zhao**, Francisco J. Reynoso. Modeling gold nanoparticle radiosensitization using a clustering algorithm to quantitate DNA double‐strand breaks with mixed‐physics Monte Carlo simulation. Medical physics. 2019;46(11):5314-5325.
4. Le Xiao, Wei Zhou, Quan Sun, **Xiandong Zhao**, Binwei Deng, Datao Gong, Di Guo et al. "Two low-power optical data transmission ASICs for the ATLAS Liquid Argon Calorimeter readout upgrade." Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 924 (2019): 160-165.
4. **Xiandong Zhao**, Hulin Wang, Li Zhou, Ruchi Gupta, Stephen Jacob Sekula, Robert Kehoe, Jingbo Ye, Ryszard Stroynowski etc al. (ATLAS Collaboration), "Performance of missing transverse momentum reconstruction with the ATLAS detector using proton‐proton collisions at 13TeV", European Physical Journal C. 2018 Nov 1;78(11). 903.
5. **Xiandong Zhao**, Hulin Wang, Li Zhou, Ruchi Gupta, Stephen Jacob Sekula, Robert Kehoe, Jingbo Ye, Ryszard Stroynowski etc al. (ATLAS Collaboration), "Search for a heavy Higgs boson in the *ZZ* to 4l and llvv final states at 13 TeV with the ATLAS detector", Physics Letters B, arXiv:1804.01126, April 2018.
6. Binwei Deng, Le Xiao, **Xiandong Zhao**, Emily Baker, Datao Gong, Di Guo, Huiqin He et al. "The latency validation of the optical link for the ATLAS Liquid Argon Calorimeter Phase-I trigger upgrade." Journal of Instrumentation 13, no. 05 (2018): P05002.
7. **Xiandong Zhao**, Hulin Wang, Li Zhou, Ruchi Gupta, Stephen Jacob Sekula, Robert Kehoe, Jingbo Ye, Ryszard Stroynowski etc al. (ATLAS Collaboration), "Measurements of the inclusive and differential cross sections in the 4l decay channel at 13 TeV with the ATLAS detector", J. High Energ. Phys., Aug. 2017.
8. Hulin Wang, **Xiandong Zhao**, Li Zhou, Ruchi Gupta, Stephen Jacob Sekula, Robert Kehoe, Jingbo Ye, Ryszard Stroynowski etc al. (ATLAS Collaboration), "Combination of searches for *WW*, *WZ*, and *ZZ* resonances in pp collision at center-of-mass 8 TeV", Physics Letters B, vol 755, pages 285-305, April 2016.
9. **Xiandong Zhao**, Chonghan. Liu, Datao. Gong, Jinghong. Chen, Di. Guo, Huiqin He, Suen Hou, Guangming Huang, Xiaoting Li, Tiankuan Liu, Xiangming Sun, Ping-Kun Teng, Le Xiao, Annie C. Xiang

and Jingbo Ye, “Mid-board miniature dual channel optical transmitter MTx and transceiver MTRx”, JINST, vol. 11, no. 1, pp. C03054 (2016).

10. Deng, Binwei, Xiaoting Li, Datao Gong, Suen Hou, Chonghan Liu, **Xiandong Zhao**, Tiankuan Liu, Ping-Kun Teng, Annie C. Xiang, and Jingbo Ye. "Low-latency and low-overhead encoder ASIC in the ATLAS LAr calorimeter trigger upgrade." International Journal of Electronics 104, no. 3 (2017): 394-403.
11. Binwei Deng, Mengxun He, Jinghong Chen, Datao Gong, **Xiandong Zhao**, Di Guo, Xiaoting Li et al. "Component prototypes towards a low-latency, small-form-factor optical link for the ATLAS liquid argon calorimeter phase-I trigger upgrade." IEEE Transactions on Nuclear Science 62, no. 1 (2015): 250-256.
12. Chonghan Liu, **Xiandong Zhao**, Jinghong Chen, Binwei Deng, Datao Gong, Di Guo, Suen Hou, Deping Huang, Xiaoting Li, Futian Liang, Guang Liu, Tiankuan Liu, Ping-Kun Teng, Annie C. Xiang, and Jingbo Ye, "The Miniature Optical Transmitter and Receiver for the High-Luminosity LHC (HL-LHC) Experiments," Journal of Instrumentation, vol. 8, no. 12, JINST 8(12):C12027, Dec. 2013.

PUBLISHED ABSTRACTS and PROFERRED PRESENTATIONS

1. **Xiandong Zhao**, Ruirui Liu, Tianyu Zhao, Francisco J. Reynoso. *Modeling Direct and Indirect Action DSBs from Intrallular Gold Nanoparticles Using a Single Cell Model with Complete Human Genome in Geant4*. Med. Phys. 47(6), E814-E815, 2020.
2. **Xiandong Zhao**, Ruirui Liu, Tianyu Zhao, Francisco J. Reynoso. *Single Cell Model with Complete Human Genome Using Geant4-DNA to Quantify Direct and Indirect Action Double-Strand Breaks.* Med. Phys. 47(6), E476-E476, 2020.
3. **Xiandong Zhao**, Ruirui Liu, Tianyu Zhao, Francisco J. Reynoso. *Intracellular Gold Nanoparticle Localization Dependence on Nuclear Dose Enhancement Using Geant4-DNA*. Med. Phys. 46(6), E227-E227, 2019.
4. Ruirui Liu, Francisco J. Reynoso., **Xiandong Zhao**, Tianyu Zhao. *Modeling the Radiosensitization Effect of Gold Nanoparticle by a Novel Simulation Framework*. Med. Phys. 46(6), E278-E278, 2019.
5. **Xiandong Zhao**, Hulin Wang, Li Zhou, Ruchi Gupta, Stephen Jacob Sekula, Robert Kehoe, Jingbo Ye, Ryszard Stroynowski etc al. (ATLAS Collaboration), *Measurements of the Higgs boson mass in the 4l decay channel at 13 TeV with the ATLAS detector*. ATLAS-CONF-2017-046, July 2017.
6. **Xiandong Zhao**, Hulin Wang, Li Zhou, Ruchi Gupta, Stephen Jacob Sekula, Robert Kehoe, Jingbo Ye, Ryszard Stroynowski etc al. (ATLAS Collaboration), *Measurement of the tau lepton reconstruction and identification performance in the ATLAS experiment using pp collisions at 13 TeV*. ATLAS-CONF-2017-029, May 2017.
7. **Xiandong Zhao**, Hulin Wang, Li Zhou, Ruchi Gupta, Stephen Jacob Sekula, Robert Kehoe, Jingbo Ye, Ryszard Stroynowski etc al. (ATLAS Collaboration), *ZZ to 4l cross-section measurements and aTGC search in 13 TeV pp collisions with the ATLAS detector*. ATLAS-CONF-2017-031, May 2017.
8. Binwei Deng, Mengxun He, Jinghong Chen, Datao Gong, **Xiandong Zhao**, Di Guo, Xiaoting Li et al. *A low-latency, small-form-factor optical link for the high-luminosity LHC experiments*. 2013 IEEE Nuclear Science Symposium and Medical Imaging Conference (2013 NSS/MIC), Seoul, 2013, pp. 1-7, doi: 10.1109/NSSMIC.2013.6829447.

For a complete list of publications please visit my Google Scholar profile.