Wei Shi

CONTACT INFORMATION

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EDUCATION

Rice University, Houston, USA

Ph.D. Physics and Astronomy, June 2020 (estimate)

- Thesis: *A Model Independent Search for BSM Bosons Decaying into Muon Pairs*

M.S. Physics and Astronomy, December 2017

- Proposal: *An Application of Multivariate Analysis to the EMTF p_T Look-Up-Table and Improvements to Dark Sector Searches*

Zhejiang University, Hangzhou, China

B.S. Physics, May 2015

- Thesis: *New Chalcogenide Materials Research*

EDUCATION EXPERIENCE

Rice University

Graduate Student 08/2015-Now

- Level-1 (L1) endcap muon trigger
  - Regression and classification on transverse momentum (p_T) using boosted decision trees and k-nearest neighbor algorithms
- Prompt analysis
  - Endcap muon track finder analyzer development
  - Muon rate, efficiency and pileup studies
  - Muon track building performance and p_T resolution
  - Timing synchronization of local charged tracks in cathode strip chambers

Research Assistant 05/2016-Now

- $MSSM + U(1)_D$ model implementation in $FeynRules2.0$
- High level trigger control paths implementation
- Muon identification & isolation scale factor study
- Muon jet analysis analyzer development

CERN, Geneva, Switzerland

CMS Collaboration Associate Member 06/2017-09/2018

- Operations
  - L1 trigger system on-call expert
  - L1 endcap muon trigger on-call expert
  - Data acquisition shifter
  - Central shift leader
  - Trigger shifter
- L1 trigger on-line control and monitor software development
- Iterative level-3 muon outside-in reconstruction algorithm optimization

UC Davis Crocker Radiation Laboratory, Davis, USA
Research Assistant 04-05/2017

- TID and SEU test with proton beam for muon port card, including FPGA, EPROM, flash memory, and optical receiver

Texas A&M University, College Station, USA
Visiting scholar 10/2016-09/2018

- MC production of Dark SUSY and NMSSM

Additional Experience

Rice University
Teaching Assistant 01/2016-06/2017

- PHYS 126 General Physics II (with Lab, E&M and optics)
- PHYS 526 Statistical Mechanics
- PHYS 201 Modern Physics

Citizens School Program, Houston
Teacher 01/2017-05/2017

- Design a one-semester-long *Fun with Physics* program for middle school students
- Give a 75-minute lecture on the waves topic for a class of 25 students
  - Design and perform hands-on experiments such as string phone, bending light using total reflection, and Doppler rocket

Quantum Transport Lab, Rice University
Summer Exchange Intern (undergraduate) 07-09/2012, 2014

- Study 2D electron gas
  - Real-time control and read-out using LabVIEW over Keithley model 6221, nanovoltmeter model 2182A and Anritsu MG3684B
  - Critical temperature measurement in cryogenic transport system
  - Temperature and resistance Calibration for low-temperature thermometer CX-1050-AA
  - Niobium alloy films fabrication using magnetron sputtering and photolithography technology

Superconducting Quantum Circuit Group, Zhejiang University
Intern (undergraduate) 06/2013-06/2014

- Study quantum non-demolition (QND) measurement in superconducting quantum circuits
  - Design and assemble the microwave circuit system, including DAC/ADC boards, clocks, low pass filters, differential amplifiers and power dividers
  - Test and calibrate the output waveform, phase and frequency spectrum
  - Work with FPGA with Quartus II Programmer

Rice Chinese Students and Scholars Association, Houston
Treasurer 05/2016-05/2017

- Funding & grant applications for the association
- Reimbursement and audition of expenses

Selected Publications	*Boosted Decision Trees in the Level-1 Muon Endcap Trigger at CMS*, CMS Conference Report 2017/357. *Search for Beyond the Standard Model New Light Boson Decaying into Muon Pairs at CMS, HIG-18-003*
Selected Presentations	*2018 EMTF Algorithm Changes Proposal*, L1 DPG Meeting, CERN, May 14, 2018 *Muon Trigger Status for 2018*, CMS Week, CERN, Apr 17, 2018 *EMTF Studies on Reconstructed Muons*, L1 DPG Meeting, CERN, Apr 9, 2018
Programming Languages	Familiar: ROOT, C/C++ Intermediate: Python, Bash, MATLAB, Java, Polymer, CSS, LabVIEW, LaTeX Basic: Keil μVision IDE, Altera Quartus II, Xilinx iMPACT