Yu-Ting Shen

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EXPERIENCE

University of Oklahoma | Graduate Research and Teaching Assistant
2011 - 2018 | Norman, Oklahoma
- 6 semesters teaching assistant for college and graduate level courses.
- Stationed at CERN and dedicated to search for supersymmertic particles since 2015.

Organisation Européenne pour la Recherche Nucléaire (CERN) | Graduate Research Assistant
2015 - 2018 | Geneva, Switzerland
- Participated in E/gamma combine performance group, same-sign 3 leptons + jets analysis group, and Higgsino LSP analysis group. Mainly contributed on electron isolation measurement, real lepton efficiency measurement, and Non-Universal Higgsino Mass model with 2 extra parameters (NUHM2) search.
- Calibrated the electron isolation efficiency by analyzing $Z \to ee$ events using Tag-and-Probe method. The results became ATLAS recommendations.
- Used C++ and Python to implement Monte Carlo, event selection and reconstruction, background suppression, maximum likelihood, and least Chi square fit to analyze collision data within 95% confidence level.
- Developed a new object-oriented programming framework in C++ increasing the performance and accuracy of the real lepton efficiency measurement. The new framework processes datasets 10 times larger than the previous one, automates analysis procedures reducing a week manual operations to 5 hours, and increases the efficiency to 98%.
- Co-developed and maintained the C++ based Tag-and-probe framework for E/gamma combine performance group.
- Took shifts in the ATLAS control room (ACR) to monitor the ATLAS inner detector operation.

Academia Sinica | Research Assistant
2009 - 2011 | Taipei, Taiwan
- Designed simulation program for the high purity germanium detector using C++ with GEANT4 package.
- Investigated the ambient background radiation and simulated the physics processes when high energy particles interact with the germanium detector.
- Maintained the extra-low temperature (77 K) environment by setting up liquid Nitrogen cooling system at Taiwan Power Company Nuclear Station II.
- Communicated across relevant governmental department and private companies.

Taiwan Semiconductor Manufacturing Company, LTD. (TSMC) | SPICE R&D engineer
2006 - 2009 | Hsinchu, Taiwan
- High-voltage SPICE (Simulation Program with Integrated Circuit Emphasis) model data collection automation, model electrical characteristic parameterization, model accuracy validation, model documentation, and customer support.
- Project leader for 3 projects, and supporter for 4 projects.
- SPICE model specification, production planning and scheduling.
- In charged of the Mix-mode and BCD HV SPICE Model projects with the following process technologies: 0.13 μm, 0.18 μm, 0.20 μm, 0.25 μm, 0.35 μm 0.5 μm, 0.60 μm.
- Tested the newly installed probe station and programmed to set up the automation reducing 20% of the measurement time.

EDUCATION

University of Oklahoma | Ph.D. in Physics | Cum. GPA: 3.47 / 4.00
2011 - 2018 | Norman, OK
- Advisor: Patrick Skubic
- Dissertation: Search for electroweak production of supersymmetric states in non-universal higgs mass model with two extra parameters compressed scenario with the ATLAS detector
  Dissertation link
- Published 4 journal papers and 5 conference notes, 18 internal notes, and presented in 2 conferences.

National Taiwan University | M.S. in Physics | Cum. GPA: 3.86 / 4.00
2003 - 2006 | Taipei, Taiwan
- Advisor: Pao-Ti Chang
- Thesis: Measurements of branching fractions and CP asymmetries in $B \to \phi\phi K$ decays at Belle
  Thesis link

- Graduate student thesis Awards, The Physical Society of Taiwan, 2006.

Chung Yuan Christian University | B.S. in Physics | Cum. GPA: 3.53 / 4.00
1998 - 2002 | Chung Li, Taiwan
- Certificate of Holistic Achievement Award, 1998 - 1999, 1999 - 2000, and 2000 - 2001
- Certificate of Academic Achievement Award, 2000 - 2001

PUBLICATIONS
178 records on INSPIRE. Here lists the main contributions and links.
Papers:
- Search for electroweak production of supersymmetric states in scenarios with compressed mass spectra at $\sqrt{s} = 13$ TeV pp collision data with the ATLAS detector
  link: PRD 97, 052010 (2018)
- Search for supersymmetry in final states with two same-sign or three leptons and jets using 36 fb^{-1} of $\sqrt{s} = 13$ TeV pp collision data with the ATLAS detector
  link: JHEP09 (2017) 084
- Search for supersymmetry at $\sqrt{s} = 13$ TeV in final states with jets and two same-sign leptons or three leptons with the ATLAS detector
  link: Eur. Phys. J. C 76 (2016) 259
- Search for resonances in diphoton events at $\sqrt{s} = 13$ with the ATLAS detector
  link: JHEP09 (2016) 001

Conference notes:
- Search for supersymmetry in final states with two same-sign or three leptons and jets using 36 fb^{-1} of $\sqrt{s} = 13$ TeV pp collision data with the ATLAS detector
  link: ATLAS-COM-CONF-2017-041
- Search for scalar diphoton resonances with 15.4 fb^{-1} of data collected at $\sqrt{s} = 13$ TeV in 2015 and 2016 with the ATLAS detector
  link: ATLAS-COM-CONF-2016-056
- Electron efficiency measurements with the ATLAS detector using the 2015 LHC proton-proton collision data
  link: ATLAS-COM-CONF-2016-028
- Search for resonances in diphoton events with the ATLAS detector at $\sqrt{s} = 13$ TeV
  link: ATLAS-COM-CONF-2016-016
- Search for supersymmetry at $\sqrt{s} = 13$ TeV in final states with jets and two same-sign leptons or three leptons with the ATLAS detector
  link: ATLAS-COM-CONF-2015-100

Internal notes:
- SUSY searches for electroweak production with compressed mass spectra at ATLAS
  link: ATL-COM-PHYS-2018-1073
- Search for weak production of compressed supersymmetry with two soft leptons and missing transverse momentum in pp collision at $\sqrt{s} = 13$ TeV with the ATLAS detector
  link: ATL-COM-PHYS-2017-1440
- Support note for electron ID: electron isolation
  link: ATL-COM-PHYS-2017-1043
- Overview of the methods used to estimate the fake lepton background in the SUSY group
  link: ATL-COM-PHYS-2017-469
- ATLAS electron, photon and muon isolation in Run 2
  link: ATL-COM-PHYS-2017-290
- Search for supersymmetry in final states with two same-sign or three leptons and jets using $\sqrt{s} = 13$ TeV pp collision data collected with the ATLAS detector
  link: ATL-COM-PHYS-2017-149
- Searches for weak production of compressed supersymmetry in pp collision at $\sqrt{s} = 13$ TeV with the ATLAS detector
  link: ATL-COM-PHYS-2016-1708
- Search for strongly-produced superpartners in final states with same-sign or three leptons and jets in 2015+2016 pp collision data at $\sqrt{s} = 13$ TeV (Supporting note for Moriond 2017)
  link: ATL-COM-PHYS-2016-1616
- Measurement of electron isolation efficiencies and scale factors with early Run-2 data
  link: ATL-COM-PHYS-2016-1181
- Search for supersymmetry at $\sqrt{s} = 13$ TeV with two same-sign leptons or three leptons with the ATLAS detector
  link: ATL-COM-PHYS-2016-865

- Search for new phenomena in diphoton events with the ATLAS detector at $\sqrt{s} = 13$ TeV: Isolation studies
  link: ATL-COM-PHYS-2016-760
- Search for strongly-produced superpartners in final states with same-sign or three leptons and jets in 2015+2016 pp collisions data at $\sqrt{s} = 13$ TeV (Supporting note)
  link: ATL-COM-PHYS-2016-495
- Isolation studies : Search for new phenomena in diphoton events with the ATLAS detector at $\sqrt{s} = 13$ TeV
  link: ATL-COM-PHYS-2016-216
- Supporting document on electron identification and efficiency measurements using the 2015 LHC proton-proton collision data
  link: ATL-COM-PHYS-2016-041
- Electron isolation efficiencies with 2015 data
  link: ATL-COM-PHYS-2015-1486
- Search for supersymmetry at $\sqrt{s} = 13$ TeV in final states with jets and two same-sign leptons or three leptons with the ATLAS detector
  link: ATL-COM-PHYS-2015-1382
- Search for strongly produced superpartners in final states with same-sign leptons or three leptons and jets in pp collisions at $\sqrt{s} = 13$ TeV (Supporting note)
  link: ATL-COM-PHYS-2015-1150
- Search for strongly produced superpartners in final states with same-sign leptons or three leptons and jets: preparing for 2015 analyses
  link: ATL-COM-PHYS-2015-329

SKILLS

Languages:
C/C++, Python (pandas/numpy/scipy/scikit-learn/matplotlib/seaborn), BASH shell script, R, VBA
Framework:
ROOT, HistFitter
Database:
SQL
Tools:
Git, SVN, Vim, LaTeX, HTML, Markdown, MicroSoft Office, Apple Pages/Numbers/Keynote
Machin Learning:
kNN, linear/logistic regression, decision tree, SVM, k-Means
OS:
Mac, Linux, Unix, Windows

LEADERSHIP

President of Taiwanese Student Association (TSA) at the University of Oklahoma

2012 – 2013

- Organized several TSA events in campus and participated in the joint events with the Taiwanese community in Oklahoma.
- Led TSA to win the first place of the Eve of Nations at the University of Oklahoma.