Yuan-Pao Yang

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# PROFILE

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| Ph.D. in theoretical high energy physics (Expected 05/2019) |
| B.S. in mathematics. Strong mathematical background with:   * Advanced calculus, linear algebra, differential equations, probability theory, and geometry. |
| Advanced training in Statistics, including:   * Statistical inferences, regression analysis, and stochastic processes. |
| Ample skills in programming and data analysis:   * 7 years quantitative research experiences with c++ and python; also familiar with Matlab, Mathematica and SAS. * Experience in online data competition, able to perform data engineering and computational data science with packages including Pandas, NumPy, Matplotlib, and Scikit-Learn |
| Self-motivated learner and passionate problem-solver |

# EDUCATION

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| **Doctor of Philosophy in Physics**‧University of Texas at Austin | Expected 05/2019 |
| Field: Theoretical High Energy Physics  Dissertation: Improving Mass Determination and Other Precision Measurements Related to New Physics Current GPA: 3.93/4.00 | |

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| **Master of Science in Physics**‧National Taiwan University | 06/2012 | |
| Field: Experimental High Energy Physics  Thesis: Measurement of cross-section between 10750 and 11050 MeV |  |

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| **Bachelor of Science in Mathematics**‧National Taiwan University  **Bachelor of Science in Physics** | 06/2009 |
| Dean’s Award (Top 10% GPA) | |

# RESEARCH EXPERIENCE

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| **Graduate Research Assistant**‧University of Texas at Austin | 09/2014 – present |
| * Modeled how measurements in high energy physics experiments are effected by detector uncertainties and particle misidentification with probability theory, stochastic processes, and Monte Carlo simulation, and use maximum likelihood estimation or other optimization method to infer other physics quantities including particle masses. * Converted physics differential equations with Fourier transformation and solved them both analytically and numerically with Numpy and SciPy. * Feature engineering with linear algebra, geometry and Voronoi tessellation, and utilized them on decay process classification. | |
| Center for Particles and Fields/ATLAS experiment | 06/2014 –08/2014 |
| * Study feature importance for data classification with different types of machine learning algorithms including artificial neural network and boosted decision trees. * Built multilepton simulation dataset for LHC Run2 with Monte Carlo simulation. | |

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| **Graduate Research Assistant**‧National Taiwan University  High Energy Physics Lab./Belle experiment | 06/2010 – 06/2012 |
| * Performed regression model on collider data to estimate physics quantities including particle masses. * Statistical hypothesis tested the existence of the hypothesized particle Yb(10900) | |

# ACTIVITIES

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| **Kaggle**, online data competitions |
| * Built and stacked models including Neural Network, Gradient Boosting Tree, and Naïve Bayes to train on 600 thousand data points and rank the probability of claiming insurance for drivers. * Built time series models to train on a 5-year sales record and forecast the sales of 4000 items in 57stores for the following 2 weeks. |

# PUBLICATIONS

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| * D. Debnath, J. S. Gainer, C. Kilic, D. Kim, K. T. Matchev, Y.-P. Yang,“ Detecting kinematic boundary surfaces in phase space: particle mass measurements in SUSY-like events” , *JHEP 06(2017)092,* [arXiv:1611.04487](https://arxiv.org/abs/1611.04487) |
| * M. D. Klimek and Y.-P. Yang, “Mass Reconstruction for High Multiplicity Final States Using the Boundary of Phase Space”, [*in Proceedings of the "Fourth Annual Large Hadron Collider Physics"*, PoS(LHCP2016)221](https://pos.sissa.it/archive/conferences/276/221/LHCP2016_221.pdf) |
| * D. Debnath, J. S. Gainer, C. Kilic, D. Kim, K. T. Matchev, Y.-P. Yang, “Identifying Phase Space Boundaries with Voronoi Tessellations”, [*Eur. Phys. J.* **C76** no. 11, (2016)645](https://link.springer.com/article/10.1140/epjc/s10052-016-4431-z), [arXiv:1606.02721](https://arxiv.org/abs/1606.02721) |
| * D. Santel, K. Kinoshita, P. Chang, *et al*. “Measurements of the(10860) and(11020) resonances via σ(e+e−→(nS)π+π−)”, [*Phys. Rev. D* **93**, 011101](https://journals.aps.org/prd/abstract/10.1103/PhysRevD.93.011101), [arXiv: 1501.01137](https://arxiv.org/abs/1501.01137) |
| * Yuan-Pao Yang, “Measurement of cross-section between 10750 and 11050 MeV”, *M.S. Thesis, National Taiwan University*, Taipei, 2012 |

# PRESENTATION

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| “Mass Reconstruction for High Multiplicity Final States Using the Boundary of Phase Space”  **PPC 2017**, TAMU Corpus Christi | 05/23/2017 |
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| “Improving mass measurement in cascade decay with Voronoi tessellations”  **MC4BSM Work Shop**, SLAC | 05/12/2017 |
| “ cross section measurement of Belle 2010 scan”  **Belle Analysis Meeting,** Belle | 02/24/2012 |