Javier M. Duarte
Department of Physics, 0319
University of California San Diego
9500 Gilman Drive
La Jolla, CA 92093-0319

office: Mayer Hall Addition 5513
email: jduarte@ucsd.edu
web: https://jduarte.physics.ucsd.edu
phone: (858) 246-4980

Education

Ph.D. Physics, California Institute of Technology 2016
Thesis: Naturalness confronts nature: Searches for supersymmetry with the CMS detector in pp collisions at $\sqrt{s}$ = 8 and 13 TeV
Advisor: Maria Spiropulu

M.S. Physics, California Institute of Technology 2015

S.B. Physics and Mathematics, Massachusetts Institute of Technology 2010
Thesis: Exotic antineutrino oscillations ($\bar{\nu}_e \to \bar{\nu}_{\not e}$) in Double Chooz
Advisor: Janet Conrad

Professional Experience

Associate Professor of Physics at UC San Diego, La Jolla, CA 2023–Present
Assistant Professor of Physics at UC San Diego, La Jolla, CA 2019–2023
Lederman Fellow at Fermilab, Batavia, IL 2016–2019
Technical Instructor in Junior Lab at MIT, Cambridge, MA 2010–2011

Fellowships and Awards

- American Physical Society Henry Primakoff Award for Early-Career Particle Physics (2024)
- UCSD Inclusive Excellence Award (2023)
- Sloan Research Fellowship (2023)
- Research Corporation For Science Advancement Cottrell Scholar Award (2023)
- UCSD Undergraduate Research Hub Outstanding Mentor Award (2021)
- DOE Early Career Award (2020)
- William A. Lee Chancellor's Endowed Junior Faculty Fellowship II (2019–Present)
- LHC Physics Center Distinguished Researcher (2019)
- Fermilab Lederman Fellowship (2016–2019) op
- NSF Graduate Research Fellowship (2011–2014)
- Gates Millenium Scholar sponsored by Hispanic Scholarship Fund (2006–2014)

Grants and External Funding

- Key Personnel for DOE Award U.S. CMS SPRINT—A Scholar Program for Research INTernship (2023-2026)
- Key Personnel for DOE Award Western Advanced Training for Computational High-Energy Physics (WATCHEP) (2022–2027).
- Key Personnel and Institute PI for NSF HDR Institute for Accelerated AI Algorithms for Data Driven Discovery (A3D3) (2021–2026).
- Key Personnel for DOE Award for HEP Consortium for Advanced Training (HEPCAT) (2021–2024).

- Co-PI for DOE Award for Real-time Data Reduction Codesign at the Extreme Edge for Science (2021–2024).
- PI of DOE Early Career Award for Real-Time Artificial Intelligence for Particle Reconstruction and Higgs Physics (2020–2025).
- Co-PI of DOE Award for FAIR Framework for Physics-Inspired Artificial Intelligence in High Energy Physics (2020–2023).
- Co-PI of NSF Award for Exploring Neural Network Processors for AI in Science and Engineering (2020–2021).
- Key Personnel for Investigating Heterogeneous Computing at the Large Hadron Collider Phase-II sub-award of Internet2 NSF Grant Exploring Clouds for Acceleration of Science (E-CAS) (2020-2021).
- DOE QuantISED Award Quantum Machine Learning and Quantum Computation Frameworks for HEP (QMLQCF) (2018–2020).
- Fermilab LDRD Award for Graph Neural Networks for Accelerating Calorimetry and Event Reconstruction (2019–2021).
- Fermilab LDRD Award for Accelerator Control with Artificial Intelligence (2019–2021).

Selected Research Experience

Higgs Boson Measurements & Combinations

- Author of CMS search for high-momentum (boosted) double Higgs boson production in the four bottom quark final state [19] and CMS statistical combination of Higgs boson pair searches [35] using full Run 2 data (2020–Present).
- Lead author of search for a highly boosted Higgs boson decaying to a bottom quark-antiquark pair using full Run 2 data [74] and contributions to the charm quark-antiquark search [16] and dedicated vector boson fusion search [14] (2017–Present).
- Co-author of first search for a highly boosted Higgs boson decaying to a bottom quark-antiquark pair using 2016 data, published in *Phys. Rev. Lett.* [101]; Adapted analysis for interpretation for differential gluon fusion Higgs boson p_{T} measurement [91]; Combination of this result with other channels led to an observation of $\mathrm{H}(\mathrm{b\bar{b}})$ decay [94] and other measurements [90] (2016–2018).
- Level-1 and high-level (software) trigger development for Higgs decaying to bottom quark-antiquark pairs produced in association with a Z boson decaying to neutrinos [94] (2016–2017).

Exotic Long-lived Particle and Dijet Searches

- Supervision of students and postdoctoral researchers performing searches for long-lived particles [1, 17, 18, 48, 57] (2019–Present).
- Co-convener of CMS Exotica Jets+X subgroup (2018–2020).
- Co-leader of analysis group searching for exotic, light spin-1 and spin-0 particles decaying to quarks [87, 88, 92, 102] (2017–2019).
- Co-leader of dijet resonance search group, including data scouting, wide resonance, and b-tagged resonance searches [79, 81, 95–97, 104] (2016–2018).

Novel Machine Learning Algorithms for Physics

- Co-convener of CMS Machine Learning Group (2023–Present).

- Development of frameworks for sharing findable, accessible, interoperable, and reusable (FAIR) data and models in high energy physics [4, 7, 15, 49] (2020–Present).
- Development of anomaly detection algorithms for new physics searches [6, 21, 50–52, 56, 58, 76] (2019–Present).
- Development of graph neural networks [44] for particle-flow reconstruction [10, 26, 29, 46, 61, 67], including explainable AI techniques [28, 53], and charged particle tracking [11, 43, 59, 71] (2019–Present).
- Supervision of students developing generative adversarial networks and autoencoders for fast sparse data generation in high energy physics [5, 24, 38, 55, 66, 73] (2019–Present).
- Contributor to the Snowmass 2022 Community Planning Exercise, including white papers on machine learning for Higgs boson pair production [42], graph neural networks [45], fast machine learning [47], and data science and machine learning in physics education [36]; Co-convenor of the CompF04 subgroup on AI Hardware [25] and contributor to EF01/EF02 Higgs Boson [33], CompF03 Machine Learning [34], and Muon Collider reports [32].
- Studies of quantum machine learning and quantum computation frameworks for high energy physics, including charged particle tracking [60] (2018–Present).
- Development of deep neural networks for identifying boosted Higgs bosons decaying to $b\bar{b}$ and $c\bar{c}$ for the CMS experiment and beyond [30, 78, 83, 85, 99] (2017–Present).

Fast Machine Learning Inference for Physics

- Set- and graph-based neural networks for jet tagging on FPGAs in the level-1 trigger [2] (2022–Present).
- Supervision of postdoctoral researchers and students developing an ASIC-based encoder for data compression in the CMS HGCAL [63] and improving its training via a differentiable Earth mover's distance [3] (2020–Present).
- Fast machine learning scientific benchmarks [37] (2022–Present).
- Development of Quantized ONNX (QONNX) framework for representing arbitrary-precision neural networks [40] (2022–Present).
- Real-time AI on FPGAs for accelerator control [62] (2018–2021).
- Development of `hls4ml` for scientific low-power machine learning devices [12, 23, 27, 39, 54, 63, 65, 69] (2020–Present).
- Development of Services for Optimal Network Inference on Coprocessors (SONIC) [9, 22, 68, 75, 84, 89] (2018–Present).
- Creation of `hls4ml` tool for creating low-latency FPGA-based firmware implementations of machine learning algorithms [41, 43, 50, 70–72, 80, 86, 98] (2017–Present).
- R&D, including firmware development and hardware demonstration, for the CMS Global Correlator Trigger for the Phase-2 upgrade of the Level-1 trigger [82] (2017–Present).

Selected Publications, Reviews, Reports, Book Chapters, and Conference Proceedings

Selected publications, reviews, reports, book chapters, and conference proceedings to which I made a substantial contribution are listed here.

[1] CMS Collaboration, "Search for long-lived particles decaying in the CMS muon detectors in proton-proton collisions at $\sqrt{s}$ = 13 TeV", (2024), arXiv:2402.01898, Submitted to *Phys. Rev. D*.

[2] P. Odagiu et al., "Sets are all you need: Ultrafast jet classification on FPGAs for HL-LHC", (2024), arXiv:2402.01876, Submitted to *Mach. Learn.: Sci. Technol.*

[3] R. Shenoy et al., "Differentiable Earth Mover's Distance for Data Compression at the High-Luminosity LHC", Mach. Learn.: Sci. Technol. **4**, 045058 (2023), doi:10.1088/2632-2153/ad1139, arXiv:2306.04712.

[4] J. Duarte et al., "FAIR AI Models in High Energy Physics", Mach. Learn.: Sci. Technol. **4**, 045062 (2023), doi:10.1088/2632-2153/ad12e3, arXiv:2212.05081.

[5] A. Li et al., "Induced Generative Adversarial Particle Transformers", in 6th Machine Learning and the Physical Sciences Workshop at the 37th Conference on Neural Information Processing Systems (Dec. 2023), arXiv:2312.04757, https://ml4physicalsciences.github.io/2023/files/NeurIPS_ML4PS_2023_213.pdf.

[6] CMS Collaboration, *Anomaly Detection in the CMS Global Trigger Test Crate for Run 3*, CMS Detector Performance Note CMS-DP-2023-079 (Oct. 2023), https://cds.cern.ch/record/2876546.

[7] R. Kansal et al., "JetNet: A Python package for accessing open datasets and benchmarking machine learning methods in high energy physics", J. Open Source Softw. **8**, 5789 (2023), doi:10.21105/joss.05789.

[8] B. Orzari et al., "LHC hadronic jet generation using convolutional variational autoencoders with normalizing flows", Mach. Learn.: Sci. Technol. **4**, 045023 (2023), doi:10.1088/2632-2153/ad04ea, arXiv:2310.13138.

[9] CMS Collaboration, *Portable Acceleration of CMS Production Workflow with Coprocessors as a Service*, CMS Physics Analysis Summary CMS-PAS-MLG-23-001 (Oct. 2023), http://cds.cern.ch/record/2872973.

[10] J. Pata et al., "Improved particle-flow event reconstruction with scalable neural networks for current and future particle detectors", (2023), arXiv:2309.06782, Submitted to *Commun. Phys.*

[11] S.-Y. Huang et al., "Low Latency Edge Classification GNN for Particle Trajectory Tracking on FPGAs", in 33rd International Conference on Field-Programmable Logic and Applications (Sept. 2023), arXiv:2306.11330.

[12] O. Weng et al., "Tailor: Altering skip connections for resource-efficient inference", (2023), doi:10.1145/3624990, arXiv:2301.07247, Accepted by *ACM Trans. Reconfigurable Technol. Syst.*

[13] R. E. Amaro et al., "Voyager - An Innovative Computational Resource for Artificial Intelligence & Machine Learning Applications in Science and Engineering", in Practice and experience in advanced research computing (Sept. 2023), p. 278, doi:10.1145/3569951.3597597.

[14] CMS Collaboration, *Search for boosted Higgs bosons produced via vector boson fusion in the $H \to b\bar{b}$ decay mode using LHC proton-proton collision data at $\sqrt{s} = 13$ TeV*, CMS Physics Analysis Summary CMS-PAS-HIG-21-020 (Aug. 2023), https://cds.cern.ch/record/2866501.

[15] E. A. Huerta et al., "FAIR for AI: an interdisciplinary and international community building perspective", Sci. Data **10**, 487 (2023), doi:10.1038/s41597-023-02298-6, arXiv:2210.08973.

[16] CMS Collaboration, "Search for higgs boson and observation of Z boson through their decay into a charm quark-antiquark pair in boosted topologies in proton-proton collisions at $\sqrt{s} = 13\,\text{TeV}$", Phys. Rev. Lett. **131**, 041801 (2023), doi:10.1103/PhysRevLett.131.041801, arXiv:2211.14181.

[17] CMS Collaboration, *Search for long-lived heavy neutral leptons decaying in the CMS muon detectors in proton-proton collisions at* $\sqrt{s} = 13\,\text{TeV}$, CMS Physics Analysis Summary CMS-PAS-EXO-22-017 (July 2023), https://cds.cern.ch/record/2865227.

[18] CMS Collaboration, "Search for long-lived particles using out-of-time trackless jets in proton-proton collisions at $\sqrt{s} = 13\,\text{TeV}$", J. High Energy Phys. **07**, 210 (2023), doi:10.1007/JHEP07(2023)210, arXiv:2212.06695.

[19] CMS Collaboration, "Search for nonresonant pair production of highly energetic Higgs bosons decaying to bottom quarks", Phys. Rev. Lett. **131**, 041803 (2023), doi:10.1103/PhysRevLett.131.041803, arXiv:2205.06667.

[20] M. Agarwal et al., "Applications of Deep Learning to physics workflows", in (June 2023), arXiv:2306.08106.

[21] Z. Hao et al., "Lorentz group equivariant autoencoders", Eur. Phys. J. C **83**, 485 (2023), doi:10.1140/epjc/s10052-023-11633-5, arXiv:2212.07347.

[22] CMS Collaboration, *Portable Acceleration of CMS Mini-AOD Production with Coprocessors as a Service*, CMS Detector Performance Note CMS-DP-2023-037 (June 2023), https://cds.cern.ch/record/2863316.

[23] J. Campos et al., "End-to-end codesign of Hessian-aware quantized neural networks for FPGAs and ASICs", (2023), arXiv:2304.06745, Submitted to *ACM Trans. Reconfigurable Technol. Syst.*

[24] R. Kansal et al., "Evaluating generative models in high energy physics", Phys. Rev. D **107**, 076017 (2023), doi:10.1103/PhysRevD.107.076017, arXiv:2211.10295.

[25] W. Bhimij et al., "Snowmass 2021 Computational Frontier CompF4 Topical Group Report Storage and Processing Resource Access", Comput. Softw. Big Sci. **7**, 5 (2023), doi:10.1007/s41781-023-00097-7, arXiv:2209.08868.

[26] F. Mokhtar et al., "Progress towards an improved particle flow algorithm at CMS with machine learning", in 21st international workshop on advanced computing and analysis techniques in physics research (Mar. 2023), arXiv:2303.17657.

[27] S. Hussain et al., "FastStamp: accelerating neural steganography and digital watermarking of images on FPGAs", in Proceedings of the 41st IEEE/ACM International Conference on Computer-Aided Design (Dec. 2022), p. 1, doi:10.1145/3508352.3549357, arXiv:2209.12391.

[28] F. Mokhtar et al., "Do graph neural networks learn traditional jet substructure?", in 5th Machine Learning and the Physical Sciences Workshop at the 36th Conference on Neural Information Processing Systems (Nov. 2022), arXiv:2211.09912.

[29] CMS Collaboration, *Progress towards an improved particle flow algorithm at CMS with machine learning*, CMS Detector Performance Note CMS-DP-2022-061 (Nov. 2022), https://cds.cern.ch/record/2842375.

[30] CMS Collaboration, *Performance of the mass-decorrelated DeepDoubleX classifier for double-b and double-c large-radius jets with the CMS detector*, CMS Detector Performance Note CMS-DP-2022-041 (Oct. 2022), https://cds.cern.ch/record/2839736.

[31] J. Duarte et al., "Editorial: Efficient AI in particle physics and astrophysics", Front. AI **5**, 999173 (2022), doi:10.3389/frai.2022.999173.

[32] K. M. Black et al., "Muon Collider Forum Report", in 2022 Snowmass Summer Study (Sept. 2022), arXiv:2209.01318.

[33] S. Dawson et al., "Report of the Topical Group on Higgs Physics for Snowmass 2021: The Case for Precision Higgs Physics", in 2022 Snowmass Summer Study (Sept. 2022), arXiv:2209.07510.

[34] P. Shanahan et al., "Snowmass 2021 Computational Frontier CompF03 Topical Group Report: Machine Learning", in 2022 Snowmass Summer Study (Sept. 2022), arXiv:2209.07559.

[35] CMS Collaboration, "A portrait of the Higgs boson by the CMS experiment ten years after the discovery", Nature **607**, 60 (2022), doi:10.1038/s41586-022-04892-x, arXiv:2207.00043.

[36] G. Benelli et al., "Data Science and Machine Learning in Education", in 2022 Snowmass Summer Study (July 2022), arXiv:2207.09060.

[37] J. Duarte et al., "FastML Science Benchmarks: Accelerating Real-Time Scientific Edge Machine Learning", in 3rd Workshop on Benchmarking Machine Learning Workloads on Emerging Hardware (MLBench) at 5th Conference on Machine Learning and Systems (MLSys) (July 2022), arXiv:2207.07958.

[38] M. Touranakou et al., "Particle-based fast jet simulation at the LHC with variational autoencoders", Mach. Learn.: Sci. Technol. **3**, 035003 (2022), doi:10.1088/2632-2153/ac7c56, arXiv:2203.00520.

[39] H. Borras et al., "Open-source FPGA-ML codesign for the MLPerf Tiny Benchmark", in 3rd Workshop on Benchmarking Machine Learning Workloads on Emerging Hardware (MLBench) at 5th Conference on Machine Learning and Systems (MLSys) (June 2022), arXiv:2206.11791.

[40] A. Pappalardo et al., "QONNX: Representing arbitrary-precision quantized neural networks", in 4th Workshop on Accelerated Machine Learning at the High-performance Embedded Architecture and Compilation 2022 Conference (June 2022), arXiv:2206.07527, https://accml.dcs.gla.ac.uk/papers/2022/4thAccML_paper_1(12).pdf.

[41] A. M. Deiana et al., "Applications and techniques for fast machine learning in science", Front. Big Data **5**, 787421 (2022), doi:10.3389/fdata.2022.787421, arXiv:2110.13041.

[42] A. Apresyan et al., "Improving Di-Higgs Sensitivity at Future Colliders in Hadronic Final States with Machine Learning", in 2022 Snowmass Summer Study (Apr. 2022), arXiv:2203.07353.

[43] A. Elabd et al., "Graph neural networks for charged particle tracking on FPGAs", Front. Big Data **5** (2022), doi:10.3389/fdata.2022.828666, arXiv:2112.02048.

[44] J. Duarte et al., "Graph neural networks for particle tracking and reconstruction", in *Artificial Intelligence for High Energy Physics*, edited by P. Calafiura et al. (World Scientific, Mar. 2022), p. 387, doi:10.1142/9789811234033_0012, arXiv:2012.01249.

[45] S. Thais et al., "Graph Neural Networks in Particle Physics: Implementations, Innovations, and Challenges", in 2022 Snowmass Summer Study (Mar. 2022), arXiv:2203.12852.

[46] J. Pata et al., "Machine Learning for Particle Flow Reconstruction at CMS", in 20th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (Mar. 2022), arXiv:2203.00330.

[47] P. Harris et al., "Physics Community Needs, Tools, and Resources for Machine Learning", in 2022 Snowmass Summer Study (Mar. 2022), arXiv:2203.16255.

[48] CMS Collaboration, "Search for long-lived particles produced in association with a Z boson in proton-proton collisions at $\sqrt{s} = 13\,\text{TeV}$", J. High Energy Phys. **03**, 160 (2022), doi:10.1007/JHEP03(2022)160, arXiv:2110.13218.

[49] Y. Chen et al., "A FAIR and AI-ready Higgs boson decay dataset", Sci. Data **9**, 31 (2022), doi:10.1038/s41597-021-01109-0, arXiv:2108.02214.

[50] E. Govorkova et al., "Autoencoders on FPGAs for real-time, unsupervised new physics detection at 40 MHz at the Large Hadron Collider", Nat. Mach. Intell. **4**, 154 (2022), doi:10.1038/s42256-022-00441-3, arXiv:2108.03986.

[51] P. Jawahar et al., "Improving variational autoencoders for new physics detection at the LHC with normalizing flows", Front. Big Data **5**, 803685 (2022), doi:10.3389/fdata.2022.803685, arXiv:2110.08508.

[52] T. Aarrestad et al., "The Dark Machines anomaly score challenge: Benchmark data and model independent event classification for the Large Hadron Collider", SciPost Phys. **12**, 43 (2022), doi:10.21468/SciPostPhys.12.1.043, arXiv:2105.14027.

[53] F. Mokhtar et al., "Explaining machine-learned particle-flow reconstruction", in 4th Machine Learning and the Physical Sciences Workshop at the 35th Conference on Neural Information Processing Systems (Dec. 2021), arXiv:2111.12840, https://ml4physicalsciences.github.io/2021/files/NeurIPS_ML4PS_2021_120.pdf.

[54] C. Banbury et al., "MLPerf Tiny benchmark", in Proceedings of the Neural Information Processing Systems Track on Datasets and Benchmarks, Vol. 1 (Dec. 2021), arXiv:2106.07597, https://datasets-benchmarks-proceedings.neurips.cc/paper/2021/hash/da4fb5c6e93e74d3df8527599fa62642-Abstract-round1.html.

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[56] S. Tsan et al., "Particle Graph Autoencoders and Differentiable, Learned Energy Mover's Distance", in 4th Machine Learning and the Physical Sciences Workshop at the 35th Conference on Neural Information Processing Systems (Dec. 2021), arXiv:2111.12849, https://ml4physicalsciences.github.io/2021/files/NeurIPS_ML4PS_2021_98.pdf.

[57] CMS Collaboration, "Search for long-lived particles decaying in the CMS endcap muon detectors in proton-proton collisions at $\sqrt{s} = 13\,\text{TeV}$", Phys. Rev. Lett. **127**, 261804 (2021), doi:10.1103/PhysRevLett.127.261804, arXiv:2107.04838.

[58] G. Kasieczka et al., "The LHC Olympics 2020: A community challenge for anomaly detection in high energy physics", Rep. Prog. Phys. **84**, 124201 (2021), doi:10.1088/1361-6633/ac36b9, arXiv:2101.08320.

[59] G. Dezoort et al., "Charged particle tracking via edge-classifying interaction networks", Comput. Softw. Big Sci. **5**, 26 (2021), doi:10.1007/s41781-021-00073-z, arXiv:2103.16701.

[60] A. Zlokapa et al., "Charged particle tracking with quantum annealing-inspired optimization", Quantum Mach. Intell. **3**, 27 (2021), doi:10.1007/s42484-021-00054-w, arXiv:1908.04475.

[61] CMS Collaboration, *Machine Learning for Particle Flow Reconstruction at CMS*, CMS Detector Performance Note CMS-DP-2021-030 (Nov. 2021), https://cds.cern.ch/record/2792320.

[62] J. S. John et al., "Real-time artificial intelligence for accelerator control: A study at the Fermilab Booster", Phys. Rev. Accel. Beams **24**, 104601 (2021), doi:10.1103/PhysRevAccelBeams.24.104601, arXiv:2011.07371.

[63] G. D. Guglielmo et al., "A reconfigurable neural network ASIC for detector front-end data compression at the HL-LHC", IEEE Trans. Nucl. Sci. **68**, 2179 (2021), doi:10.1109/TNS.2021.3087100, arXiv:2105.01683.

[64] T. Aarrestad et al., "Fast convolutional neural networks on FPGAs with hls4ml", Mach. Learn.: Sci. Technol. **2**, 045015 (2021), doi:10.1088/2632-2153/ac0ea1, arXiv:2101.05108.

[65] B. Hawks et al., "Ps and Qs: Quantization-aware pruning for efficient low latency neural network inference", Front. AI **4**, 94 (2021), doi:10.3389/frai.2021.676564, arXiv:2102.11289.

[66] B. Orzari et al., "Sparse data generation for particle-based simulation of hadronic jets in the LHC", in LatinX in AI (LXAI) Research Workshop at the 38th International Conference on Machine Learning (July 2021), arXiv:2109.15197, https://research.latinxinai.org/papers/icml/2021/pdf/paper_15.pdf.

[67] J. Pata et al., "MLPF: efficient machine-learned particle-flow reconstruction using graph neural networks", Eur. Phys. J. C **81**, 381 (2021), doi:10.1140/epjc/s10052-021-09158-w, arXiv:2101.08578.

[68] J. Krupa et al., "GPU coprocessors as a service for deep learning inference in high energy physics", Mach. Learn.: Sci. Technol. **2**, 035005 (2021), doi:10.1088/2632-2153/abec21, arXiv:2007.10359.

[69] F. Fahim et al., "Hls4ml: an open-source codesign workflow to empower scientific low-power machine learning devices", in 1st tinyML Research Symposium (Mar. 2021), arXiv:2103.05579.

[70] Y. Iiyama et al., "Distance-weighted graph neural networks on FPGAs for real-time particle reconstruction in high energy physics", Front. Big Data **3**, 44 (2021), doi:10.3389/fdata.2020.598927, arXiv:2008.03601.

[71] A. Heintz et al., "Accelerated charged particle tracking with graph neural networks on FPGAs", in 3rd Machine Learning and the Physical Sciences Workshop at the 34th Conference on Neural Information Processing Systems (Dec. 2020), arXiv:2012.01563, https://ml4physicalsciences.github.io/2020/files/NeurIPS_ML4PS_2020_137.pdf.

[72] J. Ngadiuba et al., "Compressing deep neural networks on FPGAs to binary and ternary precision with hls4ml", Mach. Learn.: Sci. Technol. **2**, 015001 (2020), doi:10.1088/2632-2153/aba042, arXiv:2003.06308.

[73] R. Kansal et al., "Graph generative adversarial networks for sparse data generation in high energy physics", in 3rd Machine Learning and the Physical Sciences Workshop at the 34th Conference on Neural Information Processing Systems (Dec. 2020), arXiv:2012.00173, https://ml4physicalsciences.github.io/2020/files/NeurIPS_ML4PS_2020_104.pdf.

[74] CMS Collaboration, "Inclusive search for highly boosted Higgs bosons decaying to bottom quark-antiquark pairs in proton-proton collisions at $\sqrt{s} = 13\,\text{TeV}$", J. High Energy Phys. **12**, 85 (2020), doi:10.1007/JHEP12(2020)085, arXiv:2006.13251.

[75] D. S. Rankin et al., "FPGAs-as-a-service toolkit (FaaST)", in 2020 IEEE/ACM International Workshop on Heterogeneous High-performance Reconfigurable Computing (H2RC) (Nov. 2020), p. 38, doi:10.1109/H2RC51942.2020.00010, arXiv:2010.08556.

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[77] HEP Software Foundation Collaboration, "HL-LHC Computing Review: Common Tools and Community Software", in 2022 Snowmass Summer Study, edited by P. Canal et al. (Aug. 2020), doi:10.5281/zenodo.4009114, arXiv:2008.13636.

[78] E. A. Moreno et al., "Interaction networks for the identification of boosted $H \to b\bar{b}$ decays", Phys. Rev. D **102**, 012010 (2020), doi:10.1103/PhysRevD.102.012010, arXiv:1909.12285.

[79] CMS Collaboration, "Search for dijet resonances using events with three jets in proton-proton collisions at $\sqrt{s} = 13\,\text{TeV}$", Phys. Lett. B **805**, 135448 (2020), doi:10.1016/j.physletb.2020.135448, arXiv:1911.03761.

[80] S. Summers et al., "Fast inference of boosted decision trees in FPGAs for particle physics", J. Instrum. **15**, P05026 (2020), doi:10.1088/1748-0221/15/05/p05026, arXiv:2002.02534.

[81] CMS Collaboration, "Search for high mass dijet resonances with a new background prediction method in proton-proton collisions at $\sqrt{s} = 13\,\text{TeV}$", J. High Energy Phys. **05**, 033 (2020), doi:10.1007/JHEP05(2020)033, arXiv:1911.03947.

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[83] E. A. Moreno et al., "JEDI-net: a jet identification algorithm based on interaction networks", Eur. Phys. J. C **80**, 58 (2020), doi:10.1140/epjc/s10052-020-7608-4, arXiv:1908.05318.

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[85] E. A. Moreno et al., "Interaction networks for the identification of Higgs boson decays to bottom quark-antiquark pairs", in 2nd Machine Learning and the Physical Sciences Workshop at the 33rd Conference on Neural Information Processing Systems (Dec. 2019), doi:10.5281/zenodo.3895048, https://ml4physicalsciences.github.io/2019/files/NeurIPS_ML4PS_2019_71.pdf.

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[115] A. Bornheim et al., "Calorimeters for precision timing measurements in high energy physics", in 16th International Conference on Calorimetry in Particle Physics (Feb. 2015), doi:10.1088/1742-6596/587/1/012057.

[116] J. Duarte, "Search for natural supersymmetry in events with 1 b-tagged jet using razor variables at 8 TeV", in 2nd Large Hadron Collider Physics Conference (Sept. 2014), arXiv:1409.4466.

Teaching

Computational Physics

- Instructor for Physics 141/241: Computational Physics I: Probabilistic Models and Simulations (Spring 2023, Winter 2022).
- Instructor for Physics 142/242: Computational Physics II: PDE and Matrix Models (Winter 2024, Spring 2022).

Machine Learning & Data Science

- Lecturer at SLAC Summer Instiute (Summer 2023).
- Lecturer at US ATLAS Machine Learning Training (Summer 2023).
- Creator of and instructor for Physics 139/239: Machine Learning in Physics (Winter 2023).
- NSF IAIFI Ph.D. Summer School Lecturer on "Representations, networks, and symmetries for learning from particle physics data" and "Model compression and fast machine learning in particle physics" (Summer 2022).
- Particle physics domain mentor for data science capstone DSC 180AB (Fall 2020, Winter 2021, Fall 2021, Winter 2022).
- Guest speaker for Purdue Physics 324: Big Data Science II (Spring 2021)
- Guest speaker for MIT 8.S50: Computational Data Science in Physics (Winter 2021).
- Creator of the LHC Physics Center Machine Learning Tutorial (2017–2020).

Computer Science & Engineering

- Guest speaker for CSE 237C: Validation and Testing of Embedded Systems (Fall 2020, Fall 2021, Fall 2022, Fall 2023).

Particle Physics

- Creator of a HEPCAT Lab Module on ML/AI on FPGAs (Summer 2023).
- Co-instructor for Physics 239: Modern Collider Physics (Spring 2023).
- UCSD instructor of record for Physics 239: Statistics in Particle Physics at the LPC [Primary instructor: Harrison Prosper, Florida State University] (Fall 2021).

Introductory Physics

- Lead instructor for Physics 2C: Fluids, Waves, Thermodynamics, and Optics for 300+ undergraduate students (Winter 2020, Winter 2021, Spring 2021).
- Teaching assistant in statistical and quantum mechanics at Caltech (2011–2012).

Seminar Courses

- Organizer of Physics 191: Undergraduate Seminar on Physics (Fall 2020) and guest speaker (Fall 2019).
- Guest speaker for Physics 261: Seminar on Physics Research at UC San Diego (Winter 2020, Winter 2021).
- Guest speaker for Thurgood Marshall College 2: Transfer Year Experience. (Fall 2021).

- Facilitator for Taking Research into Your Classroom Workshop at Waubonsee Comunity College (2017).

Physics Lab

- Technical Instructor in MIT Junior Lab, teaching third-year undergraduate physics students and maintaining the experiments (2010–2011).

Outreach

Community Outreach

- Presenter at "Career Exploration Event" at SAY San Diego Teen Leadership Connections Camp at Lincoln High School on Tuesday, July 18 (2023).
- Speaker at "Meet a US CMS Professor" for US CMS Internship Program on Wednesday, August 10 (2022).
- Exhibitor for UC San Diego Physics and Duarte Lab at the Barrio Logan Science & Art Expo on Saturday, April 16 and Souteast Science & Art Expo on Saturday, August 13 (2022).
- Panelist on "Careers in STEM Teaching and Research in Higher Education Panel" for UC San Diego Physical Sciences Division Student Success Center on Monday, November 15 (2021).
- Invited faculty speaker at UC San Diego Physics Graduate Student Diversity Initiative Grad Recruitment Fair on Saturday, October 23 (2021).
- Speaker on "Undergraduate and graduate research opportunities" at UC San Diego SACNAS Chapter's Community College Workshop on Saturday, November 21 (2020).
- Invited faculty speaker for Young Physicists Program at UC San Diego (2020).
- Co-director of Saturday Morning Physics and lectuer on Symmetry, Antimatter, and Supersymmetry at Fermilab (2018–2019).
- On-site coordinator for Saturday Morning Physics at Fermilab (2016–2018).

Mentoring

- Mentor for Cal-Bridge program (2021–Present).
- Mentor for APS National Mentoring Community (2021–Present).
- Mentor for ENLACE binational summer research program (2021–2022).
- Mentor for U.S. CMS Mentorship Program (2020–2022).

Advocacy

- U.S. LHC Users Association Annual Trip to U.S. Congress (2017, 2021).

Diversity Programs

- Co-lead faculty of local organizing committee for APS Conference on Undergraduate Women in Physics (CUWiP) at UC San Diego (2023–2025).
- PATHS Scholar Program Faculty Advocate (2022–Present).
- Creator and coordinator of A3D3 Postbaccalaureate Fellowship Program (2021–Present).
- UC San Diego Physics Department Equity, Diversity, and Inclusion Committee member (2020–2023).
- Faculty advisor for UC San Diego SACNAS Chapter (2022–Present).
- Coordinator of A3D3 NSF Institute Equity & Career Committee (2022–Present).
- US CMS Collaboration Diversity, Equity, and Inclusion Committee (2022–Present).
- Faculty advisor for UC San Diego Physics Department Graduate Student Diversity Initiative (2021).

- Mentor in the SIST internship program at Fermilab (2018)
- Graduate student ambassador for the Fermilab SHPE chapter (2018).
- Member of the TARGET program committee at Fermilab (2017–2019).
- Residential Facilitator for MIT Interphase EDGE program (2010).

Selected Conference, Workshop, and Seminar Presentations

- Machine learning at the edge of particle physics. IAIFI Summer Workshop. August 14, 2023. Northeastern University, Boston, MA, USA.
- Machine learning summary: From concept to practice. 15th International Workshop on Boosted Object Phenomenology, Reconstruction, Measurements, and Searches at Colliders. August 4, 2023. Lawrence Berkeley National Laboratory, Berkeley, CA, USA.
- Building a better foundation: Teaching physicists and machines how to learn from data. Cottrell Scholar Conference. July 19, 2023. Tucson, AZ, USA.
- Machine learning for triggering. Aspen Winter Conference: Prospecting for New Physics through Flavor, Dark Matter, and Machine Learning. March 28, 2023. Aspen Center for Physics, Aspen, CO, USA.
- Recent advances in machine learning for high energy physics. Dark Interactions: New Perspectives from Theory and Experiment. November 16, 2022.
- Measuring Higgs bosons using artificial intelligence. Physics Department Colloquium. November 3, 2022. University of California San Diego, La Jolla, CA, USA.
- Measuring Higgs bosons using artificial intelligence. The Human Side of Science Lecture Series. November 1, 2022. University of San Diego, San Diego, CA, USA.
- Model compression and fast machine learning in particle physics. IAIFI Summer School. August 2, 2022. Tufts University, MA, USA.
- Representations, networks, and symmetries for learning from particle physics data. IAIFI Summer School. August 1, 2022. Tufts University, Medford, MA, USA.
- CompF3: ML for Data Analysis Summary. Community Summer Study Snowmass 2022. July 19, 2022. University of Washington, Seattle, WA, USA.
- CompF4: AI-Hardware Summary. Community Summer Study Snowmass 2022. July 19, 2022. University of Washington, Seattle, WA, USA.
- A3D3 Postbaccalaureate Fellowship Program. Community Summer Study Snowmass 2022. July 18, 2022. University of Washington, Seattle, WA, USA.
- Enabling the Higgs self-coupling measurement with highly energetic Higgs pairs in CMS. Joint Experimental-Theoretical Physics Seminar (Wine & Cheese). June 3, 2022. Fermilab, Batavia, IL, USA.
- Accelerated Graph Neural Network Inference. Mini-workshop on Graph Neural Networks for Tracking Colocated with Connecting the Dots 2022. June 3, 2022.
- Fast Machine Learning for Science. ML Performance: Benchmarking Deep Learning Systems (MLPerf-Bench) Tutorial at the 28th IEEE International Symposium on High-Performance Computer Architectures (HPCA 2022). April 3, 2022.
- AI at the Edge of Particle Physics. HEP Seminar. November 17, 2021. Columbia University, New York, NY, USA.
- AI at the Edge of Particle Physics. AI Distinguished Lecture Series. August 12, 2021. Argonne National Laboratory.
- AI-Hardware Codesign for Real-Time Science. Harnessing Data Science for Autonomous Computing Materials Symposium. May 27, 2021. Ohio State University.

- The Edge of Particle Physics. Department of Physics and Astronomy Colloquium. May 6, 2021. Cal State LA.
- Graph Neural Networks for High Energy Physics. Elementary Particle Physics Seminar. April 28, 2021. University of Minnesota.
- `hls4ml`: An open-source codesign workflow to empower scientific low-power machine learning devices. tinyML Research Symposium. March 26, 2021.
- Graph neural network tracking on FPGAs. IRIS-HEP Topical Meeting. October 21, 2020.
- Real-time AI in particle physics. ECE Graduate Seminar. October 16, 2020. Carnegie Mellon University, Pittsburgh, PA, USA.
- Recent highlights from CMS. 53rd Annual Fermilab Users Meeting. August 12, 2020. Fermilab, Batavia, IL, USA.
- Deep learning for Higgs and new physics at the LHC. High Energy Physics Division Seminar. April 8, 2020. Argonne National Laboratory, Lemont, IL, USA.
- Low-latency machine learning inference on FPGAs. 2nd Machine Learning and the Physical Sciences Workshop at NeurIPS 2019. December 14, 2019. Vancouver, Canada.
- Deep learning for Higgs and new physics at the LHC. Department of Physics and Astronomy Colloquium. November 11, 2019. University of Kansas, Lawrence, KS, USA.
- Deep learning for Higgs and new physics at the LHC. High Energy Experiment Seminar. October 10, 2019. Boston University, Boston, MA, USA.
- Machine learning on FPGAs for low-latency and high-throughput inference. eScience 2019. September 24-27, 2019. San Diego, CA, USA.
- Deep learning on FPGAs tutorial. 1st Real Time Analysis Workshop. July 15-26, 2019. Institute Pascal, Université Paris-Saclay, Saint Aubin, France.
- Machine learning using CERN open data. LHCP 2019. May 20-25, 2019. Benemérita Universidad Autónoma de Puebla, Puebla, Mexico.
- Dark sector searches in CMS. LHCP 2019. May 20-25, 2019. Benemérita Universidad Autónoma de Puebla, Puebla, Mexico.
- FPGA-accelerated machine learning inference for particle physics. Connecting the Dots 2019. April 2, 2019. Valencia, Spain.
- Unlocking the potential of LHC data: boosted Higgs and deep learning. Particle Physics Special Seminar. February 20, 2019. University of Chicago, Chicago, IL, USA.
- Boosted Higgs couplings and dark mediators with deep learning in CMS. Joint Experimental-Theoretical Physics Seminar (Wine & Cheese). December 14, 2018. Fermilab, Batavia, IL, USA.
- Heavy flavour identification for boosted resonances and large cone jets in CMS. Machine Learning for Jet Physics (ML4Jets) 2018. November 14-16, 2018. Fermilab, Batavia, IL, USA.
- Boosted Higgs, dark matter, and deep learning. High Energy Physics Seminar. October 3, 2018. University of Pittsburgh, Pittsburgh, PA, USA.
- `hls4ml`: Deploying Deep Learning on FPGAs for L1 trigger and Data Acquisition. Topical Workshop on Electronics for Particle Physics (TWEPP) 2018. September 17-21, 2018. KU Leuven Campus Carolus, Antwerp, Belgium.
- Searches for Dark Matter Mediators with the CMS Detector. Conference on the Intersections of Particle and Nuclear Physics (CIPANP) 2018. May 29 - June 3, 2018. Hyatt Regency Indian Wells Conference Center, Indian Wells, CA, USA.
- Fast inference of deep neural networks in FPGAs for particle physics. Research Techniques Seminar. April 24, 2018. Fermilab, Batavia, IL, USA.

- Fast reconstruction and data scouting. Connecting the Dots 2018. March 20-22, 2018. University of Washington, Seattle, WA, USA.
- Boosted Higgs in CMS. Higgs Couplings 2017. November 6-10, 2017. Heidelberg University, Heidelberg, Germany.
- Unlocking the potential of CMS data: boosted Higgs, low-mass dijet resonances, and data scouting. High Energy Physics Seminar. October 30, 2017. Caltech, Pasadena, CA, USA.
- Search for low-mass dijet resonances. TeVPA 2017. August 7-11, 2017. Columbus, OH, USA.
- Inclusive search for boosted SM Higgs bosons using H to bb decays with the CMS detector at 13 TeV. APS DPF 2017. July 31 - August 4, 2017. Fermilab, Batavia, IL, USA.
- Inclusive Higgs boson search using $H \rightarrow b\bar{b}$ decays. Collider Cross Talk. July 20, 2017. CERN, Geneva, Switzerland.
- Introduction to CMS open data for boosted object tagging with machine learning applications. Data Science at High Energy Physics (DS@HEP) 2017. May 8-12, 2017. Fermilab, Batavia, IL, USA.

Service and Committee Work

- Scientific organizing committee for 2nd, 3rd, and 4th Fast Machine Learning for Science Workshops and Accelerated Artificial Intelligence for Big-Data Experiments Conference(2020–2023).
- Program committee for Fast Machine Learning for Science Workshop at ICCAD (2023).
- Reviewer for the Neural Information Processing Systems (NeurIPS) Conference (2023).
- Local organizing committee for Multi-Boson Interactions Conference at UC San Diego (2023).
- Organizer of NSF HDR Postbaccalaureate Workshop at UC San Diego (2023).
- Referee for *Physical Review Letters*, *Physical Review D*, *Physical Review Research*, *Journal of High Energy Physics*, *Physics Letters B*, *European Physics Journal C*, *Computing and Software for Big Science*, *Applied Optics*, and *Nuclear Instruments and Methods in Physics Research Section A* (2019–Present).
- Faculty advisor for UC San Diego SACNAS Chapter (2022–2023).
- Coordinator of A3D3 NSF Institute Equity & Career Committee, including Postbaccalaureate Fellowship Program (2022–2023).
- US CMS Collaboration Annual Meeting Planning Committee (2021–2023).
- US CMS Collaboration Diversity, Equity, and Inclusion Committee (2022–2023).
- Reviewer for the 2022 Datasets and Benchmarks Track, and 3rd and 4th Machine Learning for the Physical Sciences Workshops at the Neural Information Processing Systems (NeurIPS) Conference (2020–2022).
- External reviewer for Swiss Data Science Center (SDSC), French National Research Agency (ANR), US Department of Energy (DOE) Early Career Research Program, and European Science Foundation (ESF) (2019–2022).
- M.S. Thesis Committee for Paul Yen Po Wang (UC San Diego) (2021).
- Faculty advisor for UC San Diego Physics Department Graduate Student Diversity Initiative (2021).
- Guest Associate Editor for Efficient AI in Particle Physics and Astrophysics Research Topic in Frontiers in Big Data and AI (2021–2022).
- UC San Diego Physics Department Equity, Diversity, and Inclusion Committee member (2020–2022).
- UC San Diego Physics Department Graduate Admissions Committee member (2019–2022).

Supervision and Mentorship

Postdoctoral Researchers

- Melissa Quinnan (UC San Diego). Schmidt AI in Science Postdoctoral Fellow. CMS level-1 trigger, Higgs boson searches (2022–Present).
- Daniel Diaz (UC San Diego). LPC Distinguished Researcher. CMS level-1 trigger, long-lived particle searches (2021–Present).

Doctoral Students

- Daniel Primosch (UC San Diego). Higgs boson pair production searches in CMS (2023–Present).
- Hyeon Seo Yun (Purdue University). A3D3 Mentorship Program (2023–Present).
- Zihan Zhao (UC San Diego). Self-supervised learning for jet tagging (2022–Present).
- Russell Marroquin Solares (UC San Diego). CMS level-1 trigger long-lived particle tagger (2022–Present).
- Haoyang (Billy) Li (UC San Diego). Higgs boson jet assignment, FAIR AI models (2022–Present).
- Olivia Weng (UC San Diego). Optimization of AI algorithms for FPGAs (2021–Present).
- Jieun Yoo (UIC). U.S. CMS Mentorship Program (2021–2022).
- Anthony Aportela (UC San Diego). Sloan fellow, HEPCAT fellow. Graph-based autoencoders for anomaly detection; Search for long-lived particles (2021–Present).
- Daniel Guerrero (University of Florida). U.S. CMS Mentorship Program (2020–2021).
- Farouk Mokhtar (UC San Diego). HDSI fellow, IRIS-HEP fellow. Machine learned particle-flow reconstruction; Search for boosted $H \to WW$ (2020–Present).
- Raghav Kansal (UC San Diego). IRIS-HEP fellow, LPC AI fellow, LPC graduate scholar. Graph-based generative adversarial networks for particle physics simulation; Search for boosted $HH \to b\bar{b}WW$ (2019–Present).
- Martin Kwok (Brown). Boosted Higgs boson search (2018–2020).
- Michael Krohn (CU Boulder). Boosted Higgs boson search, coupling measurement, and trigger development (2017–2018).
- Sean-Jiun Wang (University of Florida). Development and monitoring of triggers for the Higgs boson produced in association with a Z boson decaying to neutrinos (2017–2018).
- Andrzej Novak (RWTH Aachen University). Development of deep neural networks for boosted Higgs identification in CMS (2017–2019).
- Jiajing Mao (Caltech). Data scouting trigger stream development (2016–2018).
- Giulia D'Imperio and Federico Preiato (Sapienza University of Rome). Dijet searches (2016).

Masters Students

- Rounak Sen (UC San Diego). Discretized GANs for particle physics (2023–Present).
- Prashant Krishnan Vaidyanathan (UC San Diego). Self-supervised learning for particle physics (2023–Present).
- Venkat Krishnamohan (UC San Diego). Graph GANs for particle physics (2022–Present).
- Selwyn Reis Gomes (UC San Diego). Xilinx Alveo coprocessor support in `hls4ml` (2022–2023).
- Nirmal Thomas (UC San Diego). Ragged batching for graph neural network inference as a service (2022–2023).

Postbaccalaureate Students

- Michael Miranda. US CMS Intern. CMS level-1 long-lived particle triggers (2023).
- Andrew Skivington (UC San Diego). A3D3 Postbaccalaureate Fellow. Anomaly detection for CMS level-1 trigger (2022–2023).

Undergraduate Students

- Jet Yue (UC San Diego). ABCD neural network for background estimation in CMS. (2023–Present).
- Evelyn Lorenzo (UC San Diego). PATHS Program Scholar (2022–2023).
- Zhaoyu Zhang (UC San Diego). Graphs GANs for particle physics (2022–Present).
- Mengke Zhang (UC San Diego). Undergraduate Research Award. Machine-learned particle-flow for the Compact Linear Collider (2022–Present).
- Anni Li (UC San Diego). IRIS-HEP fellow. Conditional generation with graph networks (2022–2023).
- Ricardo Efraín Parra Payano (Universidad Nacional de Ingeniería, Peru). APS National Mentoring Community (2022).
- Parvat Sapkota (University of Texas at Arlington). APS National Mentoring Community (2021).
- Saloni Agrawal (UC San Diego). EXPAND program. JetNet (2022–2023).
- Carlos Pareja (UC San Diego). EXPAND program. JetNet (2022–Present).
- Thomas Sievert (UC San Diego). FMP program. Quantum machine learning for high energy physics (2021–2023).
- Brian Sheldon (UC San Diego). FMP program. Boosted Higgs boson searches at the Future Circular Collider (hadron mode) (2021–Present).
- John Choi (UC San Diego). FMP program. Long-lived particle identification for CMS level-1 trigger (2021–2023).
- Ishaan Kavoori (UC San Diego). FMP program. FAIR4HEP cookiecutter FAIR AI template (2021–2023).
- Simon Poon (UC San Diego). FMP program. Machine-learned missing transverse momentum for CMS level-1 trigger (2021–Present).
- Sukanya Krishna (UC San Diego). IRIS-HEP fellow. Real-time anomaly detection for jets (2021–Present).
- Jason Liang (UC San Diego). tinyML with Brevitas and FINN. (2021–Present).
- Tai Nguyen (UC San Diego). Undergraduate Research Scholarship. tinyML with Brevitas and FINN. (2021).
- Han Hiller (University of Washington). UM-CERN-REU program. Machine-learned missing transverse momentum for CMS level-1 trigger (2021).
- Rohan Shenoy (UC San Diego). Undergraduate Research Award. Improved autoencoder training for HGCAL ASIC for data compression (2021–2023).
- John Chen (UC San Diego). AEP program. Variable-sized-input generative graph networks (2021).
- Jevon Suharnoko (UC San Diego). Dream fellow. Transpilation of PyTorch-based neural networks to FPGA firmware with `hls4ml` (2021–2022).
- Rushil Roy (UC San Diego). FMP program. tinyML with `hls4ml` (2021–Present).
- Zichun Hao (UC San Diego). FMP program, Undergraduate Research Award. Lorentz-equivariant generative neural networks and $H \to WW$ tagging (2021–2023).
- Abdelrahman Elabd (University of Pennsylvania). IRIS-HEP fellow. Implementation of graph neural networks on FPGAs and integration into hls4ml. (2021–2022).

- Haifeng Ding (UC San Diego). FMP program. Higgs pair production sensitivity at future colliders (Snowmass study). (2021).
- Steven Tsan (UC San Diego). TRELS program. Unsupervised or semi-supervised anomaly detection algorithms for high energy physics. (2020–Present).
- Vesal Razavimaleki (UC San Diego). IRIS-HEP fellow. Implementation of graph neural networks on FPGAs. (2019–2021).
- Eric Moreno (Caltech). SURF program. Development of interaction and graph neural networks for boosted jet tagging with CMS open data. (2018–2020).
- Sydney Jenknins (University of Chicago). Compression and firmware implementation of interaction and graph neural networks for charged particle tracking at the LHC (2018).
- Eric Scotti (Brown University). Development of deep neural networks for boosted Higgs identification in CMS (2017–2018).

Press

- "Inside the hunt for new physics at the world's largest particle collider" by Dan Garisto, MIT Technology Review, February 20, 2024
- "From life experience to research experience" by Sarah Charley, Symmetry Magazine, February 6, 2024
- "LHC Physicists can't save them all" by Laura Dattaro, Symmetry Magazine, November 14, 2023
- "SDSC, UC San Diego Physicist Receives 2024 Henry Primakoff Award" by Cynthia Dillon, SDSC News, October 26, 2023
- "Javier Duarte Recognized for Inclusive Excellence" by Michelle Franklin, UC San Diego School of Physical Sciences News, August 8, 2023
- "Will AI make MC the MVP of particle physics?" by R. M. Davis, Symmetry Magazine, July 18, 2023
- "Four Early Career Professors at UC San Diego Awarded Sloan Research Fellowships" by Michelle Franklin, Daniel Kane, Katherine Connor, UC San Diego Today, March 1, 2023
- "Two UC San Diego Faculty Named 2023 Cottrell Scholars" by Michelle Franklin, UC San Diego Today, February 9, 2023
- "San Diego Supercomputer Center, UC San Diego Join Federal Effort to Train Next-Gen Physics Workforce" by Cynthia Dillon, UC San Diego Today, February 7, 2023
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