Ian Cosden

Manager, HPC Software Engineering and Performance Tuning
Research Computing, OIT
Princeton University
icosden@princeton.edu

My research:
HPC software design, performance, and optimization.
Academic software/programming support.

My expertise is:
HPC code optimization and performance tuning.
Parallel Programming.

A problem I'm grappling with:
How to establish a team of Research Software Engineers (RSE) that can contribute to cutting-edge academic researcher in an meaningful and impactful way.

I've got my eyes on:
Existing successful cross-disciplinary software collaborations.

I want to know more about:
What software challenges are others facing?
What opportunities exist for RSEs in the current and future research community.

PRINCETON UNIVERSITY

Peter Elmer

Staff Researcher, Princeton University
CERN CMS Experiment Software & Computing R&D Coordinator
U.S. CMS Ops Program Software & Support L2 Manager
Lead PI for DIANA-HEP and S2I2-HEP Projects
Peter.Elmer@cern.ch

My research:
The CMS Experiment at CERN. I work on building the software and computing systems needed to operate and produce scientific results from the experiment.

My expertise is:
High Energy Physics (HEP) software and computing, large software/computing projects

A problem I'm grappling with:
Recognizing echo chamber effects in our thinking and in our organizations and finding ways to create a more dynamic and sustainable long term structure to address our challenges.

I've got my eyes on:
HEP challenges in the 2020s...

I want to know more about:
Places where HEP problems overlap with the larger research community; ideas and prior experience which show how we might collaborate on those problems.

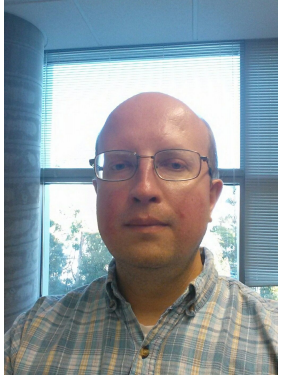
PRINCETON UNIVERSITY

CERN

CMS

diana hep

S2I2 HEP



Slava Krutelyov

Research Scientist
Department of Physics UCSD
vyacheslav.krutelyov@cern.ch

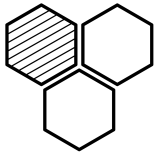
My research:
<Replace this text with your information. Replace the images at the bottom with your favourite tool logos (or anything you like!). You can add more, or delete them.>

My expertise is:
Software for collider events reconstruction at CMS and previously at CDF. Experimental HEP analyses with signatures in the standard model and beyond.

A problem I'm grappling with:

I've got my eyes on:

I want to know more about:



Matthieu Lefebvre

Research Software Engineer,
Research Computing, Princeton University
ml15@princeton.edu

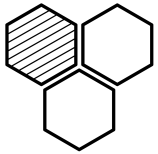
My research:
HPC applied to Geosciences and HEP

My expertise is:
Software development and optimization.

A problem I'm grappling with:
Porting track reconstruction to GPUs

I've got my eyes on:
Multi-core processors, Workflow management.

I want to know more about:
HEP challenges and software ecosystem.
Getting better understanding of the science problem.



Steve Lantz

Senior Research Associate
Cornell University Center for Advanced Computing
steve.lantz ~at~ cornell.edu

My research:
Computational research in applied physics, high performance computing

My expertise is:
HPC code optimization, parallel programming

A problem I'm grappling with:
How to help scientific codes perform well without losing sight of the science; how to get researchers to care about code quality and maintainability (software engineering)

I've got my eyes on:
Python and Jupyter

I want to know more about:
Physics - even though I spend nearly all my time on technology (willingly enough - I enjoy both)

Cornell University
Center for Advanced Computing

David Luet

Linux System Administrator, Software and Programming Analyst
Dept. of Geosciences, Research Computing OIT, PICSciE.
Princeton University
luet@princeton.edu

My research:
Adapting modern software development techniques used in the IT industry to scientific software development in academia.

PRINCETON UNIVERSITY

My expertise is:
Modern software development techniques: Continuous Integration/Continuous Testing, Source Code Management, Collaborative Software development, Agile software development.

A problem I'm grappling with:
Convincing Researchers to change the way they develop scientific codes.

I've got my eyes on:
Julia: the ease of Matlab with the speed of compiled language. At least that's the promise.

I want to know more about:
Artificial Intelligence and Machine Learning especially in their applications to science and engineering.

Tim Mattson

Intel labs Senior Principal Engineer and PI of Intel's Science and Technology center at MIT

My research:
Parallel programming … both programming languages and parallel design patterns.

Big Data problems … array storage engines, polystore DBMS, and Graph Algorithms (the GraphBLAS).

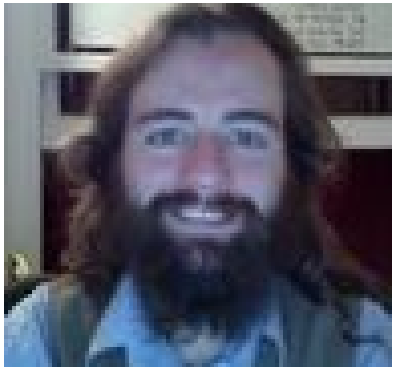
My expertise is:
Fundamental design patterns of parallel programming to help create the right parallel programming notations (e.g. OpenMP and OpenCL).

Oh, and kayaking … I am an advanced coastal kayaking coach and instructor trainer for the ACA.

A problem I'm grappling with:
Use abstract algebra to unify key-value, SQL, and array query notations and then wrap them around graphs in the language of linear algebra

I've got my eyes on:
Software frameworks to help end-user communities define their own Domain specific languages.

I want to know more about:
Physics is my passion. Computer Science is boring … It's just a tool to help us understand physics.



Jim Pivarski

DIANA-HEP team member at Fermilab's LPC
Princeton University
pivarski@fnal.gov

My research:

- Software tools for end-user physicists
- Interface between HEP software and Big Data/Machine Learning software from industry

My expertise is:
Physics analysis, Big Data ecosystem, parallelization techniques, programming language design.

A problem I'm grappling with:
Developing a declarative query language expressive enough for HEP.

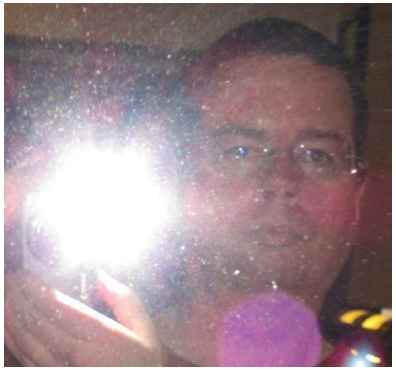
I've got my eyes on:
The varied ways physicists work; determining what coding styles seem natural to physicists.

I want to know more about:
High performance computing.

PRINCETON UNIVERSITY

diana hep

CMS Compact Muon Solenoid



Dan Riley

Research Associate, Cornell University

My research:
Multi-threaded frameworks
Parallelization and vectorization of HEP event reconstruction software (currently mostly tracking)
High-availability clusters for experiment control and data acquisition

My expertise is:
C++, threading, reliable communication protocols

A problem I'm grappling with:
Identifying the bottlenecks in complex vector/parallel code

I've got my eyes on:
How will consumer "AI" applications like self-driving cars change the hardware landscape?

I want to know more about:
Machine learning, quantum computing

Alexey Svyatkovskiy

Big Data Analyst, Princeton University
PhD in high-energy physics, Spark Summit speaker
alexeys@princeton.edu

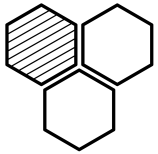
My research:
Apache Spark
Natural language processing (NLP) applications to the US legislature
Deep learning for fusion energy applications
Recurrent Neural Networks

My expertise is:
Big Data ecosystem, distributed machine learning, NLP, recurrent neural networks, physics

A problem I'm grappling with:
Half-precision float training of RNNs

I've got my eyes on:
Language interoperability

I want to know more about:



Matevž Tadel

Project Scientist at UCSD
CMS

My research:

- Vectorization & Parallelization of Track finding
- Optimization and performance tuning
- Data visualization & interaction
- Remote data access & Caching

My expertise is:
Software stuffs, little and big
C++, Perl, auto generated code

A problem I'm grappling with:
Vectorized tracking & L1 cache limits

I've got my eyes on:

I want to know more about:

XRootD

University of California San Diego

CMS Compact Muon Solenoid

Peter Wittich

Physics Professor at Cornell University
CMS collaborator, formerly SNO and CDF collaborator

My research:
BSM physics searches. Using GPGPU, Xeon Phi and other like platforms for LHC. Hardware track trigger for CMS HL-LHC upgrade

My expertise is:
New physics searches at colliders and particle physics instrumentation, specifically high speed electronics (FPGAs).

A problem I'm grappling with:
Balancing latency, throughput and processing power requirements in HEP hardware triggers

I've got my eyes on:
What will the widespread use of C++ for programming FPGAs mean for their adoption in HEP?

I want to know more about:
The robot apocalypse

Mario Masciovecchio

Post-doc researcher, UCSD
CMS Collaboration

My research:
I am a member of the CMS Collaboration, at CERN. After the Higgs discovery, I moved my interest towards searches for physics beyond the Standard Model.

My expertise is:
HEP data analysis
CMS Pixel detector

A problem I'm grappling with:
Finding SUSY

I've got my eyes on:
Where and how to get better in HEP

I want to know more about:
Machine learning, parallel computing

Abderrezak Mekkaoui

PhD, former LBNL and Fermilab Senior IC design engineer

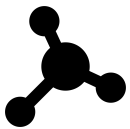
My research:
Analog front end design for particle detectors. Large pixel systems for HEP and photon science.

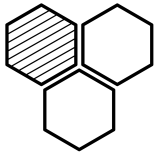
My expertise is:
Analog circuit design.

A problem I'm grappling with:
Accurate analog simulation of very large ICs (>1M transistors). Taking advantage of cloud based HPC offerings.

I've got my eyes on:
Contributing, as a consultant, to address challenges of the HL-LHC detectors and similar systems

I want to know more about:
What goes under the hood of an HPC system. How to build/tweak simulation programs for optimal performance.





Biao Wang

Graduate Student
Southern Methodist University
biaow@smu.edu

My research:
Working on NOvA and DUNE experiment.

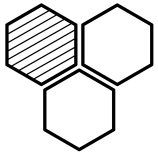
My expertise is:

Physics analysis

A problem I'm grappling with:

I've got my eyes on:
Python

I want to know more about:
GPU based deep learning



Angelo Monteux

Postdoctoral fellow (theorist)
NHETC, Rutgers University
amonteux@physics.rutgers.edu

My research:
BSM model-building, from cosmology and dark matter to the LHC.
Reinterpreting LHC searches for more general classes of models and inspiring new searches.

My expertise is:
Supersymmetry, focusing particularly on RPV SUSY in recent years.

A problem I'm grappling with:
Convincing fellow BSM theorists to get their hands dirty on LHC data.

I've got my eyes on:
New analysis techniques, including machine learning applied to BSM objects (e.g. substructure for boosted multi-jet resonances instead of simply *W*'s/tops).

I want to know more about:
HEP tools for the next 10 years.

RUTGERS

Andrés Abreu

Masters Student
University of Puerto Rico Mayagüez
Based at Fermilab
LPC Guests & Visitors Program
anazario@fnal.gov

My research:
CMS Phase 2 Forward Pixel Simulation Work; Supersymmetry Search in the 0L Final State with a Top Quark Tagger at 13 TeV (CMS Experiment).

My expertise is:
Physics Analysis and Simulation.

A problem I'm grappling with:
Switching to the gamma+Jets method to calculate the Z Invisible Background for the 2017 SUSY Analysis.

I've got my eyes on:
Phase 2 CMS upgrades and the HL-LHC.

I want to know more about:
Machine learning applications in HEP.

Anindya Ghosh

Graduate Student
The University Of Iowa
Based at CERN
ATLAS Experiment
anindya-ghosh@uiowa.edu

My research:
I am working on Dark Energy signatures in LHC
Also will start working on HGTD

My expertise is:

Physics Analysis

A problem I'm grappling with:
Working with better efficiency

I've got my eyes on:
Quality research in the Dark Energy studies which I am pursuing now.

I want to know more about:
Efficient way to handle different HEP analysis softwares and use them to get faster results.

ATLAS EXPERIMENT

CERN

THE UNIVERSITY OF IOWA

Ann Miao Wang

Graduate Student
Harvard University
ATLAS Experiment
annwang@g.harvard.edu

My research:
Currently working on the New Small Wheel upgrade to the ATLAS muon spectrometer. Looking for evidence of strong SUSY.

My expertise is:
Micromegas detector technology, strong SUSY searches

A problem I'm grappling with:
Converting and merging large(ish) sets of hex data

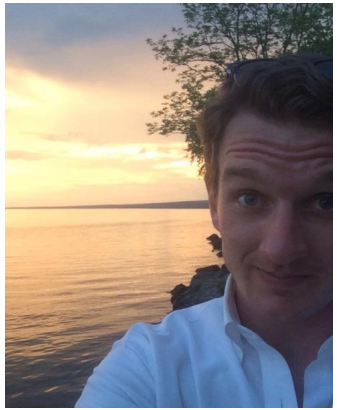
I've got my eyes on:
Parallel programming

I want to know more about:
Understanding what machine learning techniques are doing under the hood physics-wise, python <->C++ and vice versa

ATLAS EXPERIMENT

VE RI TAS

CERN



Charles Burton

Graduate Student
The University Of Texas at Austin
ATLAS Experiment
burton@utexas.edu

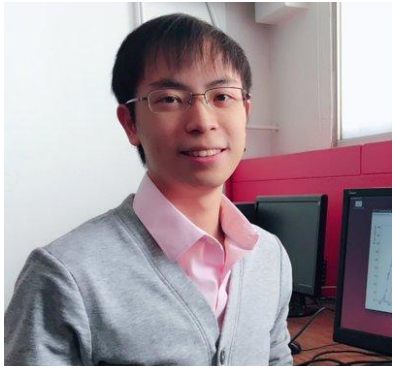
My research:
Cross-section measurement of J/ψ particle in association with a Vector boson. Measurement of the top mass through J/ψ decays. R&D and radiation testing of analog-to-digital converter for the ATLAS Calorimeter upgrade.

My expertise is:
Physics analysis in high-energy experimental physics. Using C++ and Python to measure standard model physics and search for new physics.

A problem I'm grappling with:
Improving fits on data and simulation for variables in my analysis project.

I've got my eyes on:
Performing radiation testing for the new ADC for the ATLAS experiment's calorimeter during the High-Lumi LHC runs.

I want to know more about:
Machine learning techniques and their applicability for physics analysis, tracking algorithms, etc.



Zhaoyuan “Maxwell” Cui

Graduate student
University of Arizona
cuizhaoyuan@email.arizona.edu
https://github.com/maxwellcui

My research:
I am currently involved in the study of using multivariate analysis method to enhance the searching of VLQ.

My expertise is:
GEANT4 detector simulation
TMVA analysis

A problem I’m grappling with:
Using Boosted decision tree to study the searching of VLQ

I’ve got my eyes on:
Code optimization, Parallel computation, CUDA, Machine learning in HEP

I want to know more about:
In general, everything in HEP.

UA SCIENCE Physics

THE UNIVERSITY OF ARIZONA

ATLAS EXPERIMENT

Cyril Becot

Post-doc, New York University
cyril.becot@cern.ch

My research:
H->4l and upgrade of missing energy triggers in ATLAS

My expertise is:
Physics analysis & EM calibration

A problem I'm grappling with:
Which ML algorithm is most suited to distinguish signal/background/interference in offshell H->4l

I've got my eyes on:
NA62 and its interplay with high-er energy physics

I want to know more about:
Large scale parallelized workflows and how to best use them in recasting analyses

NYU

CERN

ATLAS EXPERIMENT

Doug Davis

Graduate Student
Duke University
ATLAS Experiment
ddavis@cern.ch

My research:
Particle identification with the ATLAS Transition Radiation Tracker (TRT); Inclusive dilepton analyses with the ATLAS detector

My expertise is:
ATLAS TRT software and particle ID; standard model cross section measurements using dilepton final states.

A problem I'm grappling with:
Connecting the ATLAS software ecosystem and data format with the python machine learning ecosystem

I've got my eyes on:
Machine learning for particle identification - specifically using RNNs; using more python in HEP.

I want to know more about:
Machine learning in general, HPC, parallel computing, future HEP software

Dale Abbott

Dale Abbott
Graduate Student, UMASS Amherst
dabbott@umass.edu

My research:
I am part of the ATLAS group studying the boosted hh->4b analysis.

My expertise is:
Fitting, systematics, and higgs background studies.

A problem I'm grappling with:
Fitting fastly falling distributions.

I've got my eyes on:
Contributions to ITK upgrades. Reproducing my analysis.

I want to know more about:
Improving fit convergence for high parameter functions.

ATLAS EXPERIMENT

UNIVERSITY OF MASSACHUSETTS AMHERST 1863

CentOS

Fuyue Wang

Graduate student
Lawrence Berkeley National Lab
fuyuewang@lbl.gov

My research:
Working on the track reconstruction of ATLAS silicon detector

My expertise is:
Tracking of ATLAS inner detector.
C/C++ programming

A problem I'm grappling with:
Understanding the advantages of different neural networks

I've got my eyes on:
Big Data method and machine learning.

I want to know more about:
Neural networks implementations and parallel programming

ATLAS EXPERIMENT

BERKELEY LAB

Dylan Frizzell

PhD Student
University of Oklahoma
Argonne National Lab
dylan.frizzell@cern.ch

My research:
Currently working on pixel module assembly methods for ATLAS ITK upgrade, as well as exotics physics searches. Also recently performing testbeam measurements on prototype pixel sensors.

My expertise is:
Pixel sensors, robotics, Python, statistics, and a broad range of engineering skills (CAD, FEA, QA, Circuitry, Systems/Process control,..).

A problem I'm grappling with:
Finding enough time to learn everything I am interested in.

I've got my eyes on:
Many papers looking for a unique, impactful thesis topic.

I want to know more about:
All things machine learning.

Argonne NATIONAL LABORATORY

ATLAS EXPERIMENT

CERN

Dewen Zhong

PhD Candidate
University of Illinois Urbana-Champaign
ATLAS Experiment
Email: dzhong6@illinois.edu

My research:
FTK board testing, hh->WWbb analysis

My expertise is:
Physics analysis for HEP experiment. Tracker system simulation.

A problem I'm grappling with:
How to use Deep Neural Network to improve the accuracy of analysis.

I've got my eyes on:
SUSY

I want to know more about:
How to link DNN to the monte Carlo simulation and Physics analsyis.

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

ATLAS EXPERIMENT

CERN

Dhanush Hangal

Dhanush Hangal
Graduate Student
University of Illinois at Chicago
dhanga2@uic.edu

My research:
Studying modifications to high transverse momentum jets in the quark gluon plasma via correlations between jets with and charged particles in PbPb and pp collisions

My expertise is:
Jet energy corrections

A problem I'm grappling with:
Comprehensively understanding Monte Carlo simulation softwares

I've got my eyes on:
Machine learning for jet flavor identification and getting familiar with CMSSW

I want to know more about:
Learning and implementing new methods for physics analyses including machine learning

CMS Compact Muon Solenoid

UIC UNIVERSITY OF ILLINOIS AT CHICAGO

CERN

Jackson Burzynski

Research Assistant, University of Massachusetts Amherst

jburzynski@physics.umass.edu

My research:
The ATLAS experiment at CERN. I work on an analysis that searches for highly displaced decays.

My expertise is:
Physics analysis, vertexing algorithms

A problem I'm grappling with:
Optimizing the primary vertexing algorithm used by ATLAS to identify displaced decays with high efficiency and precision.

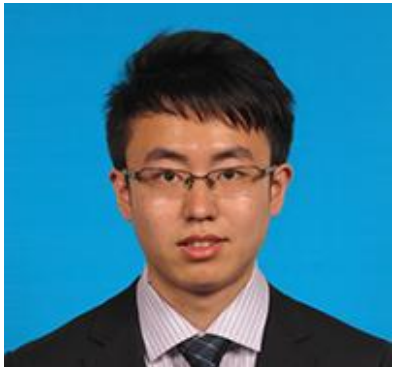
I've got my eyes on:
Extensions to the Standard Model

I want to know more about:
Parallelization and Machine Learning

ATLAS EXPERIMENT

UNIVERSITY OF MASSACHUSETTS AMHERST 1863

CERN



Jianyu Chen

Graduate Student
UC Berkeley
jianyuchen@berkeley.edu

My research:
Working on robotics systems, control systems, autonomous driving.

My expertise is:
Control theory, Robotics, optimization
Matlab, Python, C++

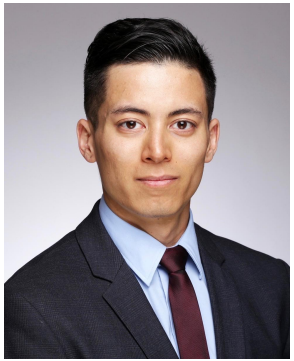
A problem I'm grappling with:
Accelerating the computation of the code I write

I've got my eyes on:
Using data-driven method (Deep learning, deep reinforcement learning) on robotics problems

I want to know more about:
Machine learning techniques
Parallel computing to accelerate computation

MSC laboratory

Berkeley
UNIVERSITY OF CALIFORNIA



Joshua Hardenbrook

Post-doctoral Researcher at Princeton University
joshua.hardenbrook@gmail.com

My research:

CMS Experiment at the LHC

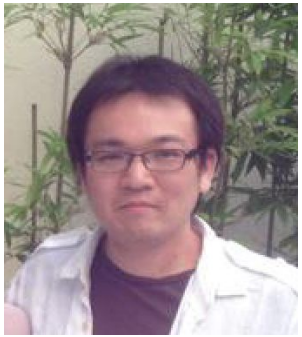
My expertise is:
Long-lived particle searches and Trigger Algorithms

A problem I'm grappling with:
When we should use NN and ML

I've got my eyes on:
Tensorflow, python

I want to know more about:
Linear models, model selection, optimization. Basics of ML. Statistical inference. Reinforcement Learning.

PRINCETON UNIVERSITY



Kazuhiro Terão

Associate Staff Scientist
SLAC National Accelerator Laboratory
Email: kazuhiro@nevis.columbia.edu
Web: www.codingkazu.com
Github: https://github.com/drinkingkazu

My research:

- Neutrino event reconstruction and analysis in LArTPC
- CNN applications development for LArTPC data
- C++ framework development for reconstruction/analysis + interface to deep learning softwares

My expertise is:
Physics analysis
Software development

- C++/Python based analysis framework
- SQL database state machine
- Interface to deep learning software in industry (caffe, TensorFlow)
- Detector electronics and hardware installation and commissioning

A problem I'm grappling with:

- 2D pixel-wise particle identification and clustering using CNN
- 3D particle trajectory tomography and pattern recognition using CNN
- GAN to overcome data/simulation discrepancy

I've got my eyes on:
Instance-aware semantic segmentation techniques (2D/3D), training techniques with small sample.

I want to know more about:
MXNet, spack build, various CNN implementations for tasks listed above

SLAC NATIONAL ACCELERATOR LABORATORY

μBooNE

Fermilab

Kamal Lamichhane

Graduate Student, Texas Tech University
kamal.lamichhane@ttu.edu

My research:
Search for BSM physics at LHC
HCAL upgrade

My expertise is:
Physics analysis: Heavy resonance, monojet, monoV

A problem I'm grappling with:
<All text can be replaced, but for consistency we recommend the headings remain.>

I've got my eyes on:
Applications of Machine learning

I want to know more about:
Machine learning, parallel programming

Lihan Liu

Graduate Student
Vanderbilt University
Email: lihan.liu@vanderbilt.edu
Web: https://ustcllh.github.io

My research:
Quark-gluon Plasma Related Research

VANDERBILT

My expertise is:
Experimental Heavy Ion Physics
C/C++ Programming

A problem I'm grappling with:

I've got my eyes on:
Data science and how it can contribute to high energy physics.

I want to know more about:
Data science, deep learning, machine learning.

Sebastian Macaluso

PhD Candidate,
NHETC, Rutgers University
macaluso@physics.rutgers.edu

My research:
Dark matter model building, BSM physics at LHC

My expertise is:
Collider phenomenology, BSM physics

A problem I'm grappling with:
Deep learning approaches to classify events at LHC

I've got my eyes on:
Applications of machine learning that could give new insights into physics problems

I want to know more about:
Data science tools, parallel programming

RUTGERS

Madhuranga Thilakasiri

Graduate Research Associate
Oklahoma State University ATLAS group
madugod@okstate.edu

My research:
I'm working on a collaboration effort that search for Vector-Like Quarks based on data collected by the ATLAS detector

My expertise is:
Vector-Like Quarks in BSM

A problem I'm grappling with:
>How machine learning can be used to tag different jets based on their characteristics

>How parallel programming can be used to my work

I've got my eyes on:
Pair-produced Vector-Like Quarks decaying into a fully hadronic final state
Python based data analysis
Deep Neural Network

I want to know more about:
Machine learning, software optimization and parallel programming

ATLAS EXPERIMENT

OKLAHOMA STATE UNIVERSITY
SCHOLARSHIP INSTRUCTION SERVICE
1890

CERN

Michael Hedges

Ph.D student, University of Hawai'i at Mānoa
Belle/Belle II and BEAST II experiments at KEK
mhedges@hawaii.edu

My research:
-SuperKEKB commissioning and beam background measurements with the BEAST collaboration
-Directional fast neutron detection in SuperKEKB commissioning
-Belle analysis probing h_b(nP) decay space

My expertise is:
e+e- collider physics and beam backgrounds
Python/C++

A problem I'm grappling with:
Exposure to the shared challenges across the various HEP frontiers

I've got my eyes on:
Robust packages such as iminuit/probfit and beyond for fitting and minimization in python

I want to know more about:
Tools and frameworks available for HEP analysis beyond conventional methods, language interoperability

Mengyao Huang

PhD Candidate
Iowa State University
mengyaoh@iastate.edu

My research:
Currently working on Simulation of DUNE TPC
Previously study on using the direction of electron, measured by high-precision TPC, as an extra method to eliminate noises from neutrino-electron scattering signals

IOWA STATE UNIVERSITY

My expertise is:
Experimental neutrino physics

A problem I'm grappling with:
Look at SnowGlobes code and how it implements the effect of the neutrino oscillations / MSW / mass hierarchy effects on the supernova neutralization burst. Figure out how hard it would be to implement the same thing in the supernova time profile generator that's used in LArsoft.

I've got my eyes on:
The connection of Machine Learning and High Energy Physics.

I want to know more about:
Machine Learning as an effective technique to discover potential new physics in high energy physics.

Nick Eminizer

PhD Student
Johns Hopkins University
CMS Experiment
nick.eminizer@gmail.com

My research:
Top physics and boosted top decays
CMS pixel systems

My expertise is:
Data Analysis
Python/C++
Top decays

A problem I'm grappling with:
ML-based lepton/jet/physics object identification
Integrating data science techniques in my thesis work

I've got my eyes on:
Parallelization/big data methods
Machine learning

I want to know more about:
Simple machine learning techniques I can adapt

Nathan Bernard

Research Assistant, University of Massachusetts Amherst

nrber0@physics.umass.edu

My research:
Search for displaced dimuon vertices using the ATLAS detector

My expertise is:
Displaced vertex analyses, muon reconstruction software within ATLAS.

A problem I'm grappling with:
Implementing novel techniques more often in everyday code.

I've got my eyes on:
How industry data science techniques can be utilized in HEP.

I want to know more about:
Machine Learning and Parallelization

ATLAS EXPERIMENT

UNIVERSITY OF MASSACHUSETTS AMHERST 1863

CERN

Nabin Poudyal

Graduate Student, Wayne State University
US CMS Experiment

My research:
Reconstruction of hadronic decay of W boson
CMS Trigger Algorithm Design

My expertise is:
HEP Monte Carlo simulation and physics study

A problem I'm grappling with:
Triggering the hadronic events at CMS

I've got my eyes on:
Developing the trigger alogrithm

I want to know more about:
HEP software and computation
Big data science and computation

Nate Woods

Grad Student, U. Wisconsin
nwoods@hep.wisc.edu
woods.nb@gmail.com

My research:
ZZ to 4 leptons and L1 calorimeter trigger at CMS

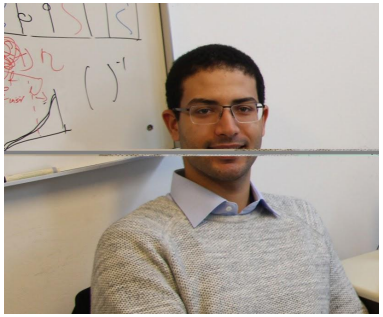
My expertise is:
Sharp needles in soft haystacks

A problem I'm grappling with:
How to tell when garbage input is giving you garbage output

I've got my eyes on:
Use and abuse of machine learning, and how to increase the use without increasing the abuse

I want to know more about:
How to propagate systematics when using these fancy but nonintuitive algorithms

THE UNIVERSITY of WISCONSIN MADISON



Othmane Rifki

PhD as of 07/07/17
University of Oklahoma
othmane.rifki@cern.ch

My research:
Event building in the ATLAS trigger, multi-lepton searches for new physics, standard model measurements

My expertise is:
New physics searches, background estimation, readout software, multi-threaded applications

A problem I'm grappling with:
The use of machine learning techniques in new physics searches

I've got my eyes on:
Computing challenges in the high luminosity LHC era

I want to know more about:
Machine learning, big data tools, high performance computing

ATLAS EXPERIMENT

Ryan Murphy

Graduate Student
Indiana University -- Bloomington
Neutrino Group
NOvA Experiment
rwmurphy@indiana.edu

My research:
Cross-section measurements, kaon/pion decay physics, and energy calibration by studying Fermilab's Booster Neutrino Beam in NOvA's Near Detector.

My expertise is:
Data analysis, reconstruction algorithms, particle/event identifiers (all in c++/ROOT)

A problem I'm grappling with:
Figuring out which CNN (and its hyperparameters) gives me the performance and speed I need for my analyses.

I've got my eyes on:
Semantic segmentation: how to implement it and what information could I potentially gain from it?

I want to know more about:
Neural nets, parallelization, and performance optimization

NOvA

INDIANA UNIVERSITY

Matt Zhang

Graduate Student
University of Illinois at Urbana-Champaign
ATLAS
mzhang60@illinois.edu

My research:
I currently work on firmware and hardware upgrades for the ATLAS inner tracker, specifically the FTk. I'm also applying machine learning techniques for use in object recognition with calorimeter energy deposits.

My expertise is:
Machine learning, tracking hardware, vertex reconstruction, FPGA programming

A problem I'm grappling with:
Figuring out how to make object recognition in calorimeters independent of eta

I've got my eyes on:
New machine learning techniques

I want to know more about:
Performance optimization, including multithreading and GPU programming

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
CERN
ATLAS EXPERIMENT
Argonne NATIONAL LABORATORY

Smita Darmora

University of Texas at Arlington
ATLAS experiment
smita.darmora@uta.edu

My research:
Search for a Heavy Stop in final states with two leptons.
Also involved in the ATLAS Distributed Computing Operation Support (ADCoS) Shifts

My expertise is:
Physics Analysis: SUSY (third generation)

A problem I'm grappling with:
Statistic for limit setting in LHC searches

I've got my eyes on:
Python, Deep learning, High performance computing

I want to know more about:
Parallel Programming, Machine learning algorithms / techniques, Functional Programming

UNIVERSITY OF TEXAS ARLINGTON

ATLAS EXPERIMENT

Sarang Mittal

Undergraduate Student (Senior)
California Institute of Technology
CMS Experiment
smittal@caltech.edu

My research:
Exploring Information Propagation in Neural Networks using Mean Field Theory and the Renormalization Group

My expertise is:
Machine Learning

A problem I'm grappling with:
Finding the optimal initialization near criticality that allows training of deep recurrent neural networks

I've got my eyes on:
Applications of RNN's to HEP; tensor networks

I want to know more about:
Parallelization, Applications of Machine Learning in HEP

Caltech

Santona Tuli

Graduate Student
University of California, Davis
Heavy-Ion Physics
CMS Experiment

My research:
Relative Suppression of excited bottomonium states in heavy-ion collisions. Observing the decay through the dimuon channel.

My expertise is:
RpA and RAA Analyses, Reconstruction efficiencies, Tag and Probe efficiencies.

A problem I'm grappling with:
Evaluating quality of fits, general programming struggles.

I've got my eyes on:
Upsilon RpA at 5.02 TeV.

I want to know more about:
My Analyses and work, Data Science, Machine Learning.

UCDAVIS
UNIVERSITY OF CALIFORNIA

CMS
Compact Muon Solenoid

Usama Hussain

Graduate Student
University of Wisconsin-Madison
usama.hussain@cern.ch

My research:
Dark matter search with a Mono-Light Z'

My expertise is:

A problem I'm grappling with:
Improve my style of coding to increase efficiency and productivity

I've got my eyes on:
Data Science as a phenomenon and its transformative role in industry

I want to know more about:
Machine Learning in HEP and beyond

Stephen Chan

Graduate Student
Harvard University
ATLAS Experiment
s.chan@cern.ch

My research:
My research focuses on VHbb searches at ATLAS, with a particular emphasis on statistical fits/combinations and on novel event descriptions.

My expertise is:
Hbb at ATLAS, trigger simulation, jets

A problem I'm grappling with:
Fit convergence

I've got my eyes on:
New techniques to better deal with high lumi environments/datasets

I want to know more about:
How to best make effective use of the plethora of computational tools available today

ATLAS EXPERIMENT

VE RI TAS HARVARD

CERN

Uzziel Perez

Graduate Student
The University of Alabama
CMS Experiment
uzzie.perez@cern.ch

My research:
Exploring Multiphoton signatures of Extradimensions (Randall-Sundrum/ADD) or for the precision testing of the Standard Model.

My expertise is:
Just starting out. Relatively knowledgeable about Python, C++, Photon IDs. Knows a little about ML like using the keras, scikit-learn.

A problem I'm grappling with:
Today, I am still setting all my computing tools up and just exploring Photon IDs for n-photon signatures, starting with n=2.

I've got my eyes on:
Reimplementing some of our group's base codes in ML (like calculating fake rates) and see there is any improvement in performance.

I want to know more about:
ML applications for HEP in general, in particular for distinguishing real photons from jets. Parallel computing, and interoperability of languages.

Wei Wei

PhD Candidate
Department of Physics, University of Illinois at Urbana-Champaign
ATLAS
weiw2@illinois.edu

My research:

Machine learning in HEP

My expertise is:
Machine Learning, Software Engineering

A problem I'm grappling with:
Apply machine learning techniques to particle identification.

I've got my eyes on:
HPC

I want to know more about:
Machine learning

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

ATLAS EXPERIMENT

Ma. Florevel (Floe) Fusin-Wischusen

Institute Manager

Princeton Institute for Computational Science & Engineering (PICSciE)
Princeton University
335 Peter B. Lewis Library
Office: (609) 258-8071 / Mobile: (267) 733-3425
floe@princeton.edu
www.princeton.edu/researchcomputing