



# Alfredo Canziani

*PhD, MEng, MSc*

*Post-Doctoral Research Scientist of Yann LeCun's lab*

✉ [canziani@nyu.edu](mailto:canziani@nyu.edu)  
🐦 [@AlfredoCanziani](https://twitter.com/AlfredoCanziani)

## **My research:**

I have been exploring deep policy networks actions uncertainty estimation and failure detection, and long term planning based on latent forward models, which nicely deal with the stochasticity and multimodality of the surrounding environment.

## **My expertise is:**

Communicate abstract and complex concepts in simple terms with the aid of computer graphics.

## **A problem I'm grappling with:**

The accessibility and democratisation of AI, often obscured by unnecessarily cryptic math.

## **I've got my eyes on:**

Pretty things and the creation of aesthetically pleasing pedagogical and informative content.

## **I want to know more about:**

3D animation of mathematical and physical drawings for educational purpose.



**NYU**

**COURANT INSTITUTE OF  
MATHEMATICAL SCIENCES**



# Ian Cosden

*Manager, HPC Software Engineering and Performance Tuning  
Research Computing, OIT  
Princeton University  
[icosden@princeton.edu](mailto: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.



# 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.Elmel@cern.ch](mailto:Peter.Elmel@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.





# Heather Gray

*Divisional Fellow,  
Physics Division, Lawrence Berkeley Laboratory  
Simulation Convenor of the ATLAS Experiment  
[hgray@lbl.gov](mailto:hgray@lbl.gov); [heather.gray@cern.ch](mailto:heather.gray@cern.ch)*

## **My research:**

I work on the ATLAS experiment and my primary research interest is in studying the Higgs boson and, in particular, its interactions with quarks. I am also working to commission the new fast simulation for ATLAS which will enable us to produce much more Monte Carlo



## **My expertise is:**

Higgs physics, track reconstruction, machine learning, pixel detectors, simulation

## **A problem I'm grappling with:**

The computing challenge for the HL-LHC: how to simulate enough MC for analyses and how to reconstruct all the data efficiently!

## **I've got my eyes on:**

Novel computing architectures and how they can be used in high energy physics

## **I want to know more about:**

How we can collaborate more effectively between disparate locations and time zones with fewer meetings





# Slava Krutelyov

*Research Scientist*  
*Department of Physics UCSD*  
[vyacheslav.krutelyov@cern.ch](mailto:vyacheslav.krutelyov@cern.ch)

## My research:

- searches for new physics with disappearing tracks
- parallelization of KF tracking
- novel methods for tracking in HL-LHC.  
Understanding interplay between tracking software and tracker detector design.

## 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 want to know more about:



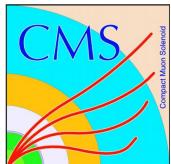


# David Lange

*Research Staff*  
*Department of Physics*  
*Princeton University*  
[David.Lange@cern.ch](mailto:David.Lange@cern.ch)

## My research:

Software integration, analysis techniques,  
event reconstruction performance optimization,  
CMS experiment and DIANA project



## My expertise is:

- Event generation, detector simulation,  
event reconstruction techniques in HEP

## A problem I'm grappling with:

- Leveraging scientific python for HEP

## I've got my eyes on:

- The vast, but unknown to expert  
application developers, resource usage of  
analysis applications in HEP  
(or at least CMS)

## I want to know more about:

- Synergies of HEP techniques with  
academic+industry community developed  
tools and applications





# 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 introduce computer-friendly techniques into scientific codes 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, Jupyter, machine learning (so I'm a student here as well as a presenter)

## **I want to know more about:**

Physics - as it seems I spend nearly all my time on technology (willingly enough - I enjoy both)



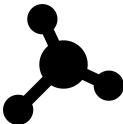
**Cornell University**  
Center for Advanced Computing



# 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.





# David Luet

*Linux System Administrator, Software and Programming Analyst*

*Dept. of Geosciences, Research Computing OIT,  
PICSciE.*

*Princeton University  
[luet@princeton.edu](mailto:luet@princeton.edu)*

## **My research:**

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

## **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.

Array storage engines, polystore DBMS, and Graph Algorithms (the GraphBLAS).

AI to generate software and to replace key algorithms in data systems (my MIT collaboration)

## **My expertise is:**

All things “parallel computing”; from programming languages and hardware to parallel design patterns. I helped create both OpenMP and OpenCL.

Oh, and kayaking ... I am kayak-surf bum and a professional kayak coach.

## **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:**

Modern C++ as a language for end-user communities to 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.



**Data Systems for AI  
for Data Systems**





# Jim Pivarski

*DIANA-HEP team member at Fermilab's LPC*  
*Princeton University*  
[pivarski@fnal.gov](mailto: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.





*Scientific Programmer  
University of Chicago*

# Benedikt Riedel

## **My research:**

Support for experiments new to the OSG  
Data management and machine learning platforms for  
single researchers to 200 members collaborations

## **My expertise is:**

Distributed computing for particle physics and  
astrophysics experiments

## **A problem I'm grappling with:**

Unified data analysis interfaces for smaller  
collaborations, data management for single  
researchers to 200 members collaborations

## **I've got my eyes on:**

Analysis toolchains, file formats beyond ROOT,  
data management and access outside of HEP

## **I want to know more about:**

Software design challenges for non-LHC  
experiments



THE UNIVERSITY OF  
**CHICAGO**



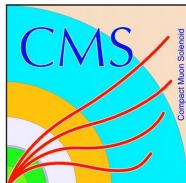
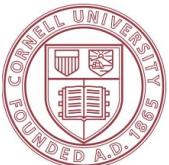


# Dan Riley

*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



# Elizabeth Sexton- Kennedy

*Software and Computing Coordinator for CMS*

*Fermilab Staff - Associate Lab Director for  
Computing and CIO  
sexton@fnal.gov*

## **My research:**

Hadron Collider Physics first on CDF and now on CMS. I'm the architect of CMSSW, the production software of CMS: <https://github.com/cms-sw/cmssw>  
I'm on the advisory board of LSST, AMCL



## **My expertise is:**

Large scale scientific software and computing solutions for HEP.

## **A problem I'm grappling with:**

How do we build a functional community to solve the software and computing problems of the HL-LHC. How do we sustain what we have.

## **I've got my eyes on:**

Dealing with all of the problems inherent in relying on heterogeneous resources.

## **I want to know more about:**

How to collaborate with people outside of the field of high energy physics computing.





# Alexey Svyatkovskiy

*Big Data Analyst, Princeton University*

*PhD in high-energy physics, Spark Summit speaker*

*alexseys@princeton.edu*

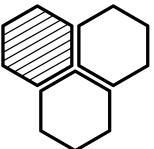
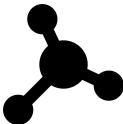
## My research:

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:





**Ma. Florevel (Floe)  
Fusin-Wischusen**

**Institute Manager**

Princeton Institute for Computational Science & Engineering (PICSciE)

Princeton University

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Office: (609) 258-8071 / Mobile: (267) 733-3425

[floe@princeton.edu](mailto:floe@princeton.edu)

[www.princeton.edu/researchcomputing](http://www.princeton.edu/researchcomputing)





# Maria Acosta

*CMS Offline Computing Operations - Site Support Team  
USCMS Security Taskforce  
Systems and Computing Engineer  
Information Technology MSc.  
Fermi National Accelerator Laboratory*  
[macosta@fnal.gov](mailto:macosta@fnal.gov)  
[macostaf@cern.ch](mailto:macostaf@cern.ch)

## My research:

HTC - HPC grid scientific computing environments and infrastructure. On-premises and Hybrid cloud models for efficient data analysis.



## My expertise is:

Grid/Distributed computing DevOps  
(Development + Operations) and Infrastructure

## A problem I'm grappling with:

[1] How to efficiently scale a grid pool and regulate workload based on users, software and computing resources' behavior patterns

## I've got my eyes on:

Using ML or AI techniques to solve [1]

## I want to know more about:

I'd like to better understand physicists' requirements and their vision of the future of Computing for a collaborative effort towards it



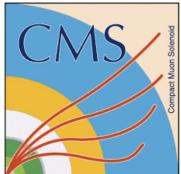


# Antonis Agapitos

*Postdoctoral researcher,  
Experimental High Energy Physics,  
CMS experiment, CERN  
[ph2632@gmail.com](mailto:ph2632@gmail.com),  
skype: "ph2632"*

## My research:

Compressed Supersymmetry,  
Large extra dimensions ADD model



## Affiliation

Recently:



currently:



heading to:



## My expertise is:

Design analysis/searches for beyond the standard model physics for LHC data

## A problem I'm grappling with:

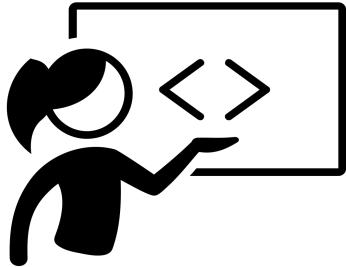
Various software related problems.

## I've got my eyes on:

Machine learning, Neural Networks, AI.

## I want to know more about:

All aspects of Artificial Intelligence.  
Humankind behavior and predictability.

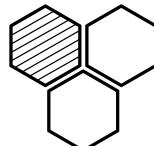
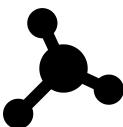


# Brad Bachu

<Your title and contact details go here.  
Replace images (photo above and images at the bottom) by right clicking and selecting “replace image...”. You can then drag and drop any image. This will automatically resize your image to fit the template.>

## 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:

<All text can be replaced, but for consistency we recommend the headings remain.>

## 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:

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## I want to know more about:

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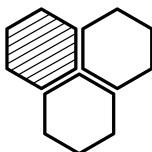
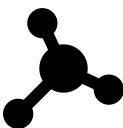


# Amandeep Singh Bakshi

PhD Student  
Purdue University  
[bakshi3@purdue.edu](mailto:bakshi3@purdue.edu)

## My research:

Our group seeks to conduct precision measurements of spin correlations of the ttbar system by studying the dilepton final states.



## My expertise is:

I am familiar with data analysis methods specific to my research, and have coursework in ML but I wouldn't call it an expertise.

## A problem I'm grappling with:

Understanding and implementing Unfolding.  
Finding a picture to upload here.

## I've got my eyes on:

Learning how to implement ML methods (TMVA in ROOT, TensorFlow) in a future project.

## I want to know more about:

Parallel Programming



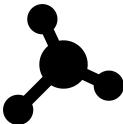


# Ramya Bhaskar

*Physics Grad Student*  
*University of Washington-Seattle*  
[rbhaskar@uw.edu](mailto:rbhaskar@uw.edu)  
[rbhaskar@ucdavis.edu](mailto:rbhaskar@ucdavis.edu)

## My research:

Jets reconstruction from exotic Higgs decays via deep learning and lower-level tracks/vertices, and Top quark processes. Worked on CMS previously, specifically on id'ing Top, Higgs, W and Z Bosons using boosted event shapes



**My expertise is:**  
CV/ML applications to physics problems.

**A problem I'm grappling with:**  
network performance plateau

**I've got my eyes on:**  
ML/AI, feature analysis, parallel programming

**I want to know more about:**  
parallel programming!





# Saptaparna Bhattacharya

*Post-doctoral Research Associate,  
Northwestern University.  
CMS Collaboration  
Ph.D. Brown University (2016)  
[saptaparna.bhattacharya@northwestern.edu](mailto:saptaparna.bhattacharya@northwestern.edu)*

## My research:

I look for rare triboson processes predicted by the Standard Model and study the timing capabilities of the next generation of calorimeters.



Northwestern  
University

## My expertise is:

Data analysis, studying performance of HEP detectors, Monte Carlo (MC) event generators

## A problem I'm grappling with:

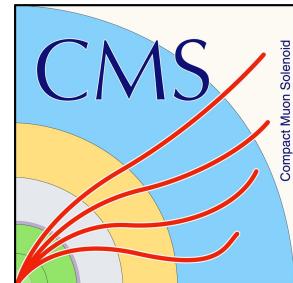
Reducing backgrounds so I see a  $3\sigma$  signal!

## I've got my eyes on:

MC event generation using generative adversarial models

## I want to know more about:

Machine learning, parallel computing





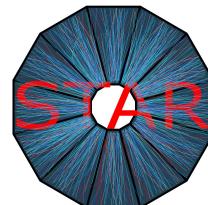
# Irakli Chakaberia

*Postdoc*  
Kent State University / Shandong University / BNL  
[iraklic@cern.ch](mailto:iraklic@cern.ch)

## My research:

For my PhD I studied di-boson processes at the CMS experiment.

Now I work on the software for the STAR experiment's iTPC upgrade, at RHIC collider, both for simulation and data reconstruction.



## My expertise is:

High energy particle/nuclear physics and some related software.

## A problem I'm grappling with:

Parallelising clustering algorithm at STAR experiment. Improving performance of JUNO software IO.

## I've got my eyes on:

ML/AI solution to particle ID at STAR.

## I want to know more about:

ML / AI methods that are already employed and successful in HEP. And where is the critical point in the QGP phase diagram?!





# Tongguang Cheng

*Post-doc of Purdue University Northwest  
CMS collaboration  
[tongguang.cheng@cern.ch](mailto:tongguang.cheng@cern.ch)*

## My research:

- New resonance search in di-Z boson final state**
- Z' search through its cascade decay**
- Pixel quality monitoring**



## My expertise is:

Alignment and calibration for CMS offline

## A problem I'm grappling with:

Pixel quality/condition automation

## I've got my eyes on:

Machine learning for data quality monitoring

## I want to know more about:

Machine learning, parallel computing





# Rachael Creager

*Ph.D. Candidate, University of Pennsylvania  
(expected graduation: Spring 2020)*

*ATLAS Collaboration*

*rcreager@cern.ch*

*rccreager@gmail.com*

## **My research:**

Heavy flavor physics and calibration, top-quark decay measurements, di-Higgs decays to b quarks



## **My expertise is:**

Heavy flavor physics, distributed computing, basics of machine learning

## **A problem I'm grappling with:**

Understanding scaling and computational problems in ML

## **I've got my eyes on:**

Developing my technical skills in machine learning, understanding why to use one tool versus another

## **I want to know more about:**

Balanced approaches to ML, i.e. getting practical results without relying on a DL “black box”





# Souvik Das

*Current: Engineering Physicist, Purdue Univ.*

*MS, PhD Experimental Particle Physics, Cornell Univ.*

*Postdocs at Cornell Univ., Univ. of Florida, Purdue Univ.*

[souvik1982@gmail.com](mailto:souvik1982@gmail.com)

## My research:

Higgs detection through decays into bottom quarks,  
Higgs pair production. Engineering upgrades to the CMS  
detector for the HL-LHC

Generation 1007

## My expertise is:

Data acquisition frameworks, data analysis, Higgs physics, making laboratory research fun for students and postdocs

## A problem I'm grappling with:

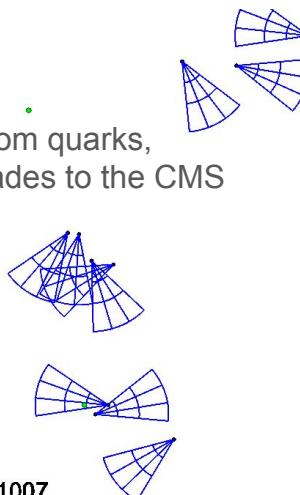
Mapping optimization problems in physics onto quantum annealers

## I've got my eyes on:

Generative adversarial neural networks, spiking neural networks, social environments for AI agents

## I want to know more about:

Generative neural networks to replace event generation, detector simulation and reconstruction





# Dipsikha Debnath

*PhD student, Department of Physics, University of Florida (graduating in summer 18)*

*email: [dipsikha.debnath@gmail.com](mailto:dipsikha.debnath@gmail.com)*

## **My research:**

HEP data analysis specially for BSM physics,  
implementation of BSM models in MC event  
generators

## **My expertise is:**

Collider Phenomenology, Data analysis.

## **A problem I'm grappling with:**

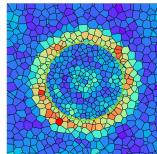
Applying RecNN to classify jets

## **I've got my eyes on:**

Machine learning applications in BSM physics

## **I want to know more about:**

Parallel programming, GAN, autoencoder,  
PyTorch, unsupervised ML approaches in HEP  
data analysis



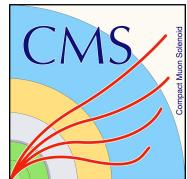


# Nabarun Dev

*PhD Candidate, Department of Physics, University of Notre Dame (expected 2019).*

## My research:

Search for Lepton Flavor Violating Decays of the Higgs Boson. I have also worked on the ECAL L1 trigger of the CMS experiment and ECAL barrel electronics upgrade.



**My expertise is:**  
Data analysis, BDTs, Neural Nets

**A problem I'm grappling with:**  
ML based Anomaly detection in DQM systems

**I've got my eyes on:**  
Many interesting ML applications in particle physics

**I want to know more about:**  
Hadoop, Spark, Hive, PyTorch, Julia



# Justin (Gage) DeZoort

Incoming Ph.D. Student, Department of Physics,  
Princeton University

jdezoort@princeton.edu

## My research:

CERN's Compact Muon Solenoid (CMS) Experiment:  
BRIL, Higgs decay to bottom quarks  
Liquid Argon PET scanner electronics testing



**My expertise is:**  
C/C++, Python, ROOT

**A problem I'm grappling with:**  
Writing adaptable, easy to read code

**I've got my eyes on:**  
Adding more efficient and reliable computational  
techniques to my work

**I want to know more about:**  
ML, parallel computing, good coding practices,  
standards and organization





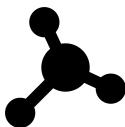
# Terrence Edmonds

*PhD student. Department of Physics, Purdue University.*

[tedmonds@purdue.edu](mailto:tedmonds@purdue.edu)

## My research:

Studying the dynamics of QGP in HENP collisions at STAR.



## My expertise is:

C++, ROOT, high pT pion correlations, making tea

## A problem I'm grappling with:

Finding high pT signal for f0(980) in AuAu collisions.

## I've got my eyes on:

Improvements in MC simulations in the low mass region and opportunities for ML and data analysis in other fields

## I want to know more about:

Machine Learning's limitations





# Nicolò Foppiani

*PhD Student (first year) in the Department of Physics,  
Harvard University*

*Previously I was a student at Scuola Normale Superiore  
nicolofoppiani@g.harvard.edu*

## My research:

I work on the MicroBooNE experiment, a liquid argon TPC neutrino detector. My focuses are shower reconstruction and electron neutrino analyses.

I previously worked on CMS, on the analysis for the W mass measurement, and on Top Quark studies for the FCC-ee.



**HARVARD UNIVERSITY**  
Department of Physics

## My expertise is:

Particle physics detection, statistical data analysis, machine learning, electronics, and wine tasting

## A problem I'm grappling with:

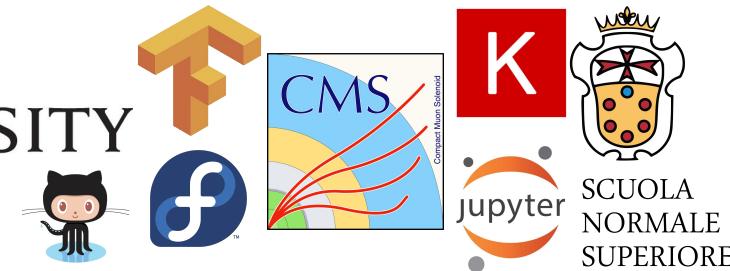
Compiling code written by my colleagues!

## I've got my eyes on:

Using data, visualization techniques, and statistics to show facts of the actual life in a clear and convincing way (eg. immigration in Europe)

## I want to know more about:

Is machine learning the way to create an artificial intelligence able to do multiple and different tasks?



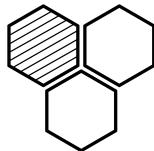
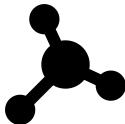


# Blake Forland

*PhD Student, Indiana University, ATLAS*  
*bforland@indiana.edu*

## My research:

I am working on the ATLAS detector at CERN. My analysis is investigating the boosted hh->wwBB channel. Interested in and using machine learning in my research.



## My expertise is:

Particle Physics (di-higgs production and decay), machine learning, public speaking

## A problem I'm grappling with:

Auto labeling machine learning data. Network design and measuring performance.

## I've got my eyes on:

Using recursive nets to create multi-classifiers

## I want to know more about:

How to use machine learning techniques in powerful and creative ways.





# Reddy Pratap Gandrajula

*Postdoc at Michigan State University.  
NOvA, DUNE neutrino experiments  
gandraju@msu.edu*

## **My research:**

Neutrino oscillation measurements, Electromagnetic showers reconstruction in Liquid Argon TPC's. Neutrino cross section studies, neutrino event simulations.



**MICHIGAN STATE**  
**U N I V E R S I T Y**

## **My expertise is:**

B meson decays, data analysis, neutrino event simulations, basic machine learning

## **A problem I'm grappling with:**

Convolutional neural network algorithms in segmenting images (event displays) to implement in neutrino analyses

## **I've got my eyes on:**

Acquired basic machine learning knowledge

## **I want to know more about:**

Machine learning, deep learning techniques





# Abhijith Gandrakota

*PhD Candidate.*

*Department of Physics*

*Rutgers University*

*abhijith@physics.rutgers.edu*

## **My research:**

- Multijet resonance searches with data scouting techniques using CMS detector
- L1 Tracking and jet clustering

**My expertise is:**

Multijet searches, Data analysis

**A problem I'm grappling with:**

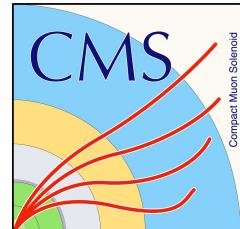
Parallelizing my code. Implementing quick and FPGA compatible MVA techniques for L1 Tracking and jet clustering

**I've got my eyes on:**

GANs to look for BSM physics. Writing faster python code.

**I want to know more about:**

ML techniques and their limitations, parallel computing and good version control.





# Daniel Gawerc

*BS Physics, recent graduate  
California Institute of Technology  
dgawerc@caltech.alumni.edu*

## My research:

- Timing studies with the CMS ECAL.
- Quantum circuits with HEP implications.

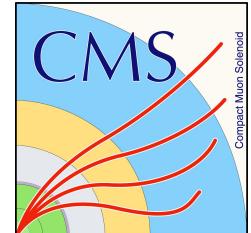
**My expertise is:**  
Quantum computing

**A problem I'm grappling with:**  
Extracting implications for high energy physics from quantum circuits, and how to build them with this in mind.

**I've got my eyes on:**  
Machine learning and perhaps QML.

**I want to know more about:**  
Low-level Python.

# Caltech





# Micah Groh

*PhD Student. Indiana University  
NOvA Experiment  
mcgroh@iu.edu*

**My research:**

Neutrino oscillation measurements and event reconstruction using deep learning techniques.

**My expertise is:**

Data analysis and event reconstruction techniques.

**A problem I'm grappling with:**  
What is git?

**I've got my eyes on:**

Applying ML techniques to HEP measurements.

**I want to know more about:**

Working with big data.



# Allie Reinsvold Hall

Postdoctoral Research Associate  
CMS Experiment  
Fermi National Accelerator Laboratory  
[ahall@fnal.gov](mailto:ahall@fnal.gov)

## **My research:**

As a graduate student I worked on a search for gauge-mediated supersymmetry breaking in events with two photons and missing transverse energy. At Fermilab, I'm just starting work on a project to rewrite the CMS tracking algorithms to take advantage of highly parallel architectures.



## **My expertise is:**

CMS physics analysis and computing operations

## **A problem I'm grappling with:**

How to best use highly parallel architectures with existing reconstruction algorithms

## **I've got my eyes on:**

How to prepare the CMS computing model to handle the challenges of the HL-LHC

## **I want to know more about:**

Machine learning techniques and novel ways to apply them





# Amanda Harrison

*PhD student, Purdue University*  
*Expected graduation: 2023*  
*harri724@purdue.edu*

## **My research:**

I work in theoretical astrophysics and simulate relativistic plasma flow to model blazar jets.



**My expertise is:**  
Understanding how quasars radiate

**A problem I'm grappling with:**  
How to best simulate magnetohydrodynamic fluids

**I've got my eyes on:**  
Making cool simulations

**I want to know more about:**  
Anything that will speed up and improve my coding skills

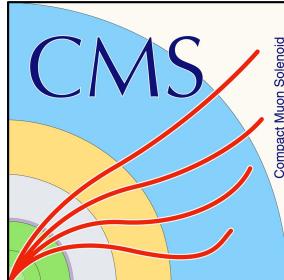


# Bobak Hashemi

Graduate Researcher, CMS experiment, UCSD  
[bhashemi@ucsd.edu](mailto:bhashemi@ucsd.edu)

## My research:

My thesis is on a SUSY dark matter search in a dilepton final state. I am interested in GANs and other ML algos



## My expertise is:

Data analysis, leptonic searches, GANs

## A problem I'm grappling with:

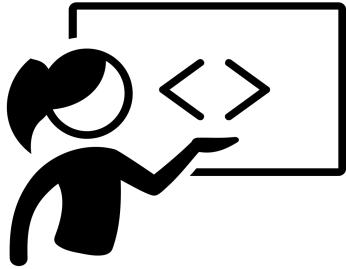
Training a GAN to learn how to produce MC

## I've got my eyes on:

New ML techniques, foundational questions in quantum information and quantum gravity.

## I want to know more about:

Different ML libraries, their strengths and weaknesses. How ML is being applied to future endeavors in fundamental physics



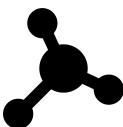
# Nicolas (Nick) Haubrich

<Your title and contact details go here.

Replace images (photo above and images at the bottom) by right clicking and selecting “replace image...”. You can then drag and drop any image. This will automatically resize your image to fit the template.>

## 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:

<All text can be replaced, but for consistency we recommend the headings remain.>

## 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:

<All text can be replaced, but for consistency we recommend the headings remain.>

## I want to know more about:

<All text can be replaced, but for consistency we recommend the headings remain.>





# Simen Hellelund

*PhD student, University of Oslo*  
[simen.hellesund@fys.uio.no](mailto:simen.hellesund@fys.uio.no)  
[simen.hellesund@cern.ch](mailto:simen.hellesund@cern.ch)

## My research:

I am searching for exotic phenomenon in the dilepton final state using the ATLAS detector.



**My expertise is:**  
Data analysis.

**A problem I'm grappling with:**  
Anomaly detection in distributed computing.  
Closing vim when I accidentally open it.

**I've got my eyes on:**  
Future colliders, outreach, artificial intelligence.

**I want to know more about:**  
Advanced machine learning techniques,  
parallelisation, git, philosophy of science.

UiO : University of Oslo



# Mazin Khader

*PhD student at UIUC  
ATLAS Experiment  
mwkhader@gmail.com*

## **My research:**

I study Exotic Higgs decays with final states being pairs of collimated, low energy b-quarks. Novel techniques are required to find such signatures.



**My expertise is:**  
Data analysis, double b-tagging

**A problem I'm grappling with:**  
Calibrating a low energy double b-tagger

**I've got my eyes on:**  
Learning new ML/statistical learning methods and bolstering my computing skills

**I want to know more about:**  
ML, parallel computing, good version control





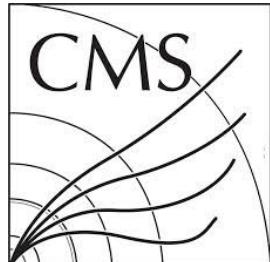
# Savvas Kyriacou

*PhD candidate expected now.*

*Rutgers the State University of New Jersey*  
*savvasphy@gmail.com*

## **My research:**

Photon Identification  
Track reconstruction using FPGAs  
Boosted techniques in SUSY searches.



## **My expertise is:**

Photons. Substructure identification in jets.  
Reconstruction and optimization algorithms.

## **A problem I'm grappling with:**

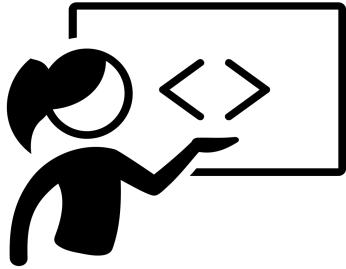
Group projects and code maintenance.  
Multiple transparent terminals covering my small screen.

## **I've got my eyes on:**

Trends in computing and physics like AI techniques and generative algorithms.

## **I want to know more about:**

How new tools can help us do more interesting physics and improve our current ways.



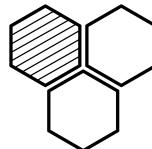
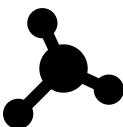
# Qisen Lin

<Your title and contact details go here.

Replace images (photo above and images at the bottom) by right clicking and selecting “replace image...”. You can then drag and drop any image. This will automatically resize your image to fit the template.>

## My research:

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## My expertise is:

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## A problem I'm grappling with:

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## I've got my eyes on:

<All text can be replaced, but for consistency we recommend the headings remain.>

## I want to know more about:

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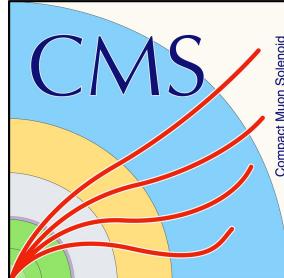


# Mia Liu

*Postdoc Fermilab CMS group.*  
*mliu@fnal.gov*

## **My research:**

I work on the CMS experiment and my main research interests are in searches for supersymmetric particles and testing the standard model. I am also interested in silicon based detectors and worked on the Phase 1 upgrade of the pixel detector for CMS.



## **My expertise is:**

Silicon based detectors; Tracker;  
Supersymmetry; Standard Model measurements

## **A problem I'm grappling with:**

Search for very very rare standard model processes.

## **I've got my eyes on:**

Use machine learning in CMS phase 2 upgrade

## **I want to know more about:**

Computing architecture development trend and how this affects artificial intelligence development; How high energy particle research can benefit and challenge recent machine learning algorithms.



# Kelvin Mei

*Ph.D. Candidate,  
Department of Physics  
Princeton University  
[kmei@princeton.edu](mailto:kmei@princeton.edu)*

**My research:**  
Phase I HCAL upgrade for CMS at the LHC  
Search for Stealth SUSY in multi-jet final states

**My expertise is:**  
Data analysis, learning languages

**A problem I'm grappling with:**  
Understanding the vast amount of different machine learning techniques being implemented

**I've got my eyes on:**  
Looking at novel ways of implementing ML and AI to my current analysis and future applications

**I want to know more about:**  
What challenges faces ML and how one can contribute to the community, both within physics and in the broader sense.



# Tielige Mengke

*PhD Candidate  
Department of Physics  
Texas Tech University*

**My research:**  
CMS HGCAL phase II upgrade

**My expertise is:**  
data analysis

**A problem I'm grappling with:**  
Improving the performance of the coding

**I've got my eyes on:**  
ML and data science tools

**I want to know more about:**  
Every main topic that is covered here





# Aaron Mislivec

*Postdoc*

*Department of Physics and Astronomy  
University of Minnesota Twin Cities  
misli002@umn.edu*

## **My research:**

- Neutrino-nucleus interactions and how the uncertainties on models of these interactions affect neutrino oscillation measurements
- I currently work on the NOvA and DUNE neutrino oscillation experiments,

UNIVERSITY OF MINNESOTA



## **My expertise is:**

Neutrino-nucleus interactions and neutrino oscillations

## **A problem I'm grappling with:**

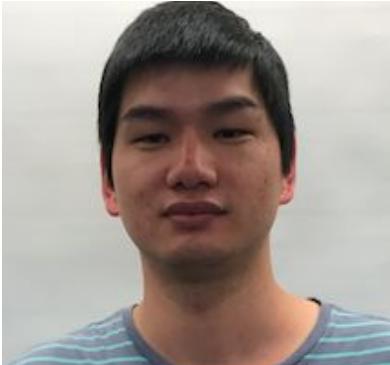
Potential biases in CVN-based neutrino-event selection resulting from neutrino-nucleus interaction mis-modeling

## **I've got my eyes on:**

Applications of machine learning in HEP

## **I want to know more about:**

Machine learning in general



# Hong Ni

*Ph.D. Candidate  
Department of Physics and Astronomy  
Vanderbilt University  
hong.ni@vanderbilt.edu*

**My research:**  
Strange particle production

**My expertise is:**  
Data analysis

**A problem I'm grappling with:**  
Poorly documented code written by others

**I've got my eyes on:**  
How new technology changes the field of  
particle physics.

**I want to know more about:**  
Machine Learning, Version control



VANDERBILT  
UNIVERSITY

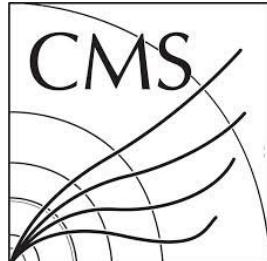




# Noah Paladino

*Undergraduate Physics Major  
Rutgers the State University of New Jersey  
[noah.paladino@rutgers.edu](mailto:noah.paladino@rutgers.edu)*

**My research:**  
Searching for vector-like quarks with a  $B \rightarrow bH$  decay.



**My expertise is:**

Analysis of events recorded by the CMS detector.

**A problem I'm grappling with:**

Efficiency without compromising understandability and working to improve ease of access to shared code.

**I've got my eyes on:**

Improving analysis performance through parallel processing and more efficient I/O.

**I want to know more about:**

The usage of emerging analysis tools like neural networks in high energy physics.



# Nilesh Patil

*Data Scientist  
Center for Vaccine Biology & Immunology  
University of Rochester  
[nilesh.patil@rochester.edu](mailto:nilesh.patil@rochester.edu)*

## **My research:**

Exploring applications of machine learning and network science across different domains. Building scientific tools on top of existing data analysis software ( large scale simulations with pyspark, cell tracking, reconstruction and analysis in live tissue e.t.c)



## **My expertise is:**

Large scale data analysis and associated grunt work, machine learning, network science

## **A problem I'm grappling with:**

Adapting neural networks for applications to scientific problems - lack of large, clean, labeled datasets, hacky nature of inference, inconsistent code and data sharing practices

## **I've got my eyes on:**

Developing methodologies and tools implementing consistent network analysis and machine learning techniques on top of networkX, spark, tensorflow, pytorch - among others

## **I want to know more about:**

- Existing efforts and approaches for incorporating ML in scientific analysis
- Visualization in ML
- HPC, Quantum computing and ML



# Mariel Pettee

*Physics PhD Candidate (Expected 2020)*  
*Yale University*  
*mariel.pettee@yale.edu*

## My research:

- $VH \rightarrow \tau\tau$  in ATLAS Run 2
- Trigger-level tau identification with RNNs

# Yale



## My expertise is:

- The ATLAS Tau Trigger

## A problem I'm grappling with:

- Developing an RNN to generate dance from 3D motion capture data

## I've got my eyes on:

- Autoencoders
- Generative adversarial networks

## I want to know more about:

- Other machine learning structures that could better suit particle identification or HEP event classification problems
- Visualizing and interpreting machine learning model outputs



# Harish Potti

*Physics PhD candidate, ATLAS experiment  
The University of Texas at Austin  
[harish.potti@utexas.edu](mailto:harish.potti@utexas.edu)*

## My research:

- Measurement of Higgs boson - top quark Yukawa coupling
- Search for flavor changing neutral currents in top decays ( $t \rightarrow Hq$  ( $q = u, c$ ))



## My expertise is:

Statistical analysis, RooFit & RooStats, Analysis optimization

## A problem I'm grappling with:

Parallelization of code, dealing with pointers and objects in C++, submission of batch jobs with Condor

## I've got my eyes on:

Developing machine learning techniques to measure Higgs boson - top quark Yukawa coupling

## I want to know more about:

Parallel programming, Multivariate analysis techniques, neural networks





# Cristiana Principato

*Ph.D. Candidate, University of Virginia  
(expected graduation: Fall 2018)  
NOVA Collaboration  
[crisprin@fnal.gov](mailto:crisprin@fnal.gov)*

## **My research:**

An indirect search for WIMPs in the Sun using upward going muons in NOVA.  
WIMPs could annihilate in the core of a massive object and produce SM particles like neutrinos that we can detect.



**My expertise is:**  
Data analysis & pizza.

**A problem I'm grappling with:**  
Writing a code to place an upper limit on my analysis

**I've got my eyes on:**  
Machine learning, Neural Networks

**I want to know more about:**  
Machine learning





# Hardik Routray

*Ph.D Candidate, Rutgers University  
Expected 2022*  
[hardik.routray@cern.ch](mailto:hardik.routray@cern.ch) / [hroutray@fnal.gov](mailto:hroutray@fnal.gov)

**My research:**  
Lifetime measurements of decayed particles

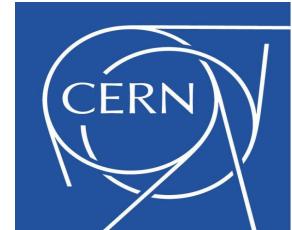


**My expertise is:**  
Numerical and Analytical Physics, Biking

**I'm grappling with:**  
Vertexing

**I've got my eyes on:**  
Parallel Programming

**I want to know more about:**  
Machine Learning Techniques





# Eli Bæverfjord Rye

*PhD student, University of Oslo*

*(Expected 2021)*

*ATLAS collaboration*

[e.b.rye@fys.uio.no](mailto:e.b.rye@fys.uio.no) / [eli.baverfjord.rye@cern.ch](mailto:eli.baverfjord.rye@cern.ch)

## **My research:**

Electroweak supersymmetry, in particular the search for charginos and neutralinos in events with three leptons and missing energy.

**My expertise is:**  
Supersymmetry, milking cows

**A problem I'm grappling with:**  
Figuring out all the steps of an experimental analysis, from start to finish (in particular in ATLAS)

**I've got my eyes on:**  
SUSY

**I want to know more about:**  
Machine learning, HPC, statistical data analysis, global fits, version control ++



**UiO** : University of Oslo





# Rohith Saradhy

*Ph.D Candidate, University of Minnesota  
(Expected 2022)  
CMS collaboration  
[rsaradhy@cern.ch](mailto:rsaradhy@cern.ch) | sarad005@umn.edu*

**My research:**  
Development and testing of clock distributions systems, gain calibrations for CMS HGCAL Detectors



**My expertise is:**

Hardware development using FPGA, Raspberry Pi and Arduino.

**A problem I'm grappling with:**

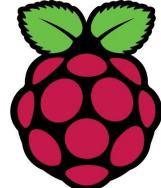
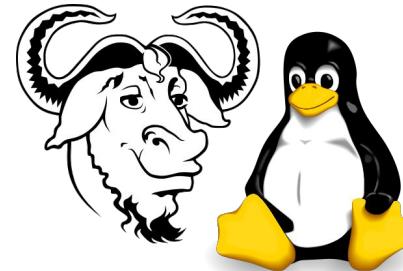
Calibrating gain for low statistics boards,

**I've got my eyes on:**

Machine Learning

**I want to know more about:**

ML and Parallel programming





# Leigh Schaefer

*Ph.D. Candidate, University of Pennsylvania  
(expected graduation May 2019)*

*ATLAS Collaboration  
[leigh.schaefer@cern.ch](mailto:leigh.schaefer@cern.ch)*

## **My research:**

Searches for Supersymmetric particles in the R-parity violating  $U(1)_{\{B-L\}}$  gauged extension to the MSSM;  
Work in the Transition Radiation Tracker software group to improve tracking and electron identification performance.



## **My expertise is:**

Tracking software, in particular in the TRT;  
sample production for group use

## **A problem I'm grappling with:**

Improving the efficiency of analysing so much data, and minimizing the storage required for it

## **I've got my eyes on:**

How to apply ML and other computing techniques to HEP research and beyond

## **I want to know more about:**

Machine learning, its advantages and disadvantages over more traditional methods





# Erich Schmitz

*PhD Candidate, University of Kansas*

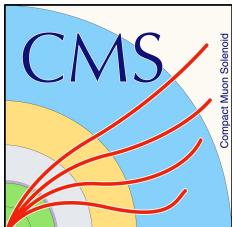
*Expected: 2020*

*CMS Collaboration*

*erichjs@ku.edu*

## **My research:**

Searches for Vector Like partners to third generation quarks. di-Higgs searches,  $\text{HH} \rightarrow 4\text{b}$  &  $\text{HH} \rightarrow \text{bb}\gamma\gamma$



## **My expertise is:**

Boosted techniques in jet tagging, b jet tagging, pyROOT, python interfacing with CMSSW

## **A problem I'm grappling with:**

Understanding how the extra tools in the Higgs Combine package work (i.e. opening the black box)

## **I've got my eyes on:**

Applications of ML to jet tagging.

## **I want to know more about:**

Various ML packages available in python, and how to best use them





# Sourav Sen

*PhD Candidate, Duke University  
Expected: 2020  
ATLAS Collaboration  
[sourav.sen@duke.edu](mailto:sourav.sen@duke.edu)*

## **My research:**

Measurement of vector boson fusion Higgs boson production cross-section in the  $H \rightarrow WW^* \rightarrow e\nu\mu\nu$  decay channel, Optimizing the Clustering and Tracking in Dense Environment (CTIDE) neural networks, W boson mass measurement at CDF



## **My expertise is:**

Writing and training vanilla neural networks in keras and tensorflow, FPadsoft (software for “Future Particle Detector” studies), POWHEGBOX, pyROOT and python

## **A problem I’m grappling with:**

Speeding up a set of neural networks used to resolve merged charged clusters on ATLAS pixel trackers

## **I’ve got my eyes on:**

All aspects of ML applied in HEP

## **I want to know more about:**

I am interested to learn more about all the aspects of ML





# Suyog Shrestha

*Postdoctoral Researcher  
Ohio State University  
ATLAS Experiment (LHC)  
suyog@cern.ch*

## **My research:**

LHC physics: precision measurements & search for new physics, trigger performance, kinematic fitting, boosted topologies, machine learning applications, Detector R&D (CMOS sensors)



## **My expertise is:**

Application of kinematic fitting in new physics search, Evaluation of systematic uncertainties on simulated data, statistical data analysis

## **A problem I'm grappling with:**

Improving sensitivity to rare physics processes, and in this context, devising metric to evaluate different ML algorithms

Reducing systematic uncertainties on simulated data at a smaller computing cost

## **I've got my eyes on:**

Application of machine learning to new physics search and trigger performance

## **I want to know more about:**

Systematic bias due to ML algorithm (if any)

Applications of a typical hepex physicist's skills in data science industry

Potential avenue of collaboration between the expertise in AI industry and academia

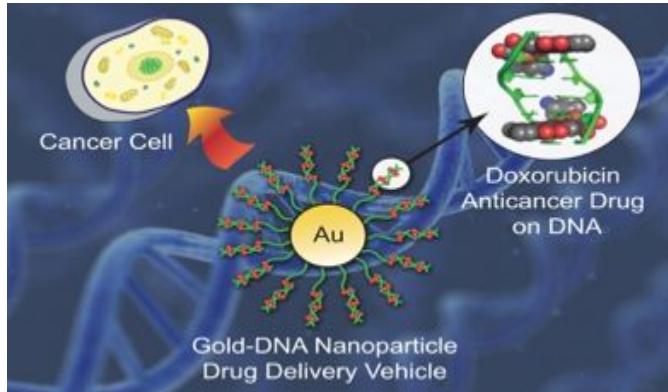


# Namita Shokeen

*PhD Candidate, Wayne State University  
(expected graduation: May 2019)*

## My research:

Study the transport properties of nanoparticles which is useful for drug delivery.



## My expertise is:

Dynamics of nanoparticles in polymer solutions.

## A problem I'm grappling with:

Particle tracking in dense solutions.

## I've got my eyes on:

How to apply machine learning to find diffusion of nanoparticles in different solutions.

## I want to know more about:

Use of HEP analysis methods in different fields of soft matter physics.





# Weinan Si

*PhD Candidate, University of California, Riverside*  
*Expected: 2019*  
*CMS Experiment*  
*<weinan.si@cern.ch>*

## **My research:**

Search for dark matter with displaced lepton jet  
pixel sensor QA with testbeam

**My expertise is:**  
using different tools to make life easier

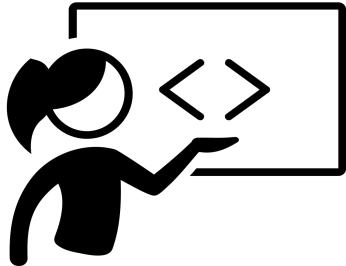
**A problem I'm grappling with:**  
Long-lived particle reconstruction in CMS

**I've got my eyes on:**  
Improving long-lived particle reconstruction  
under existed framework with ML

## **I want to know more about:**

novel track reconstruction  
HPC application on HEP jobs  
parallel programming  
ML application in reco and analysis





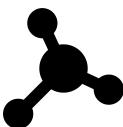
# David Smith

<Your title and contact details go here.

Replace images (photo above and images at the bottom) by right clicking and selecting “replace image...”. You can then drag and drop any image. This will automatically resize your image to fit the template.>

## 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:

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## 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:

<All text can be replaced, but for consistency we recommend the headings remain.>

## I want to know more about:

<All text can be replaced, but for consistency we recommend the headings remain.>





# Jean Somalwar

*Princeton University*  
*Expected Graduation: 2020*  
*somalwar@princeton.edu*

## **My research:**

Search for dark matter subhalos in data from the Fermi Large Area Telescope (LAT) using non-poissonian statistical techniques

## **My expertise is:**

Dark matter searches in gamma ray data

## **A problem I'm grappling with:**

Minimizing a non-poissonian likelihood in the quickest and most efficient way

## **I've got my eyes on:**

Applications of machine learning and parallel processing to dark matter searches in Fermi data

## **I want to know more about:**

Machine Learning, parallel processing



**PRINCETON  
UNIVERSITY**



# Benjamin Tannenwald

*Postdoc at University of Virginia  
CMS Experiment  
[benjamin.tannenwald@cern.ch](mailto:benjamin.tannenwald@cern.ch)*

## My research:

Hardware upgrades for the CMS detector to reach 30 ps timing resolution in the HL-LHC era. Developing triggers for new physics using timing information. Measuring ttH production.



## My expertise is:

C++, Python, ROOT. Lots and lots of ROOT.

## A problem I'm grappling with:

Using ML pattern recognition to separate signal from background

## I've got my eyes on:

Learning as much as I can about this whole 'machine learning' thing

## I want to know more about:

Python tools that can be leveraged in HEP. Also parallel computing



# Vakhtang Tsiskaridze

*Postdoctoral Researcher  
Stony Brook University  
ATLAS Experiment  
[tsiskari@cern.ch](mailto:tsiskari@cern.ch)*

## **My research:**

SUSY searches (top squark) with the ATLAS detector;  
Standard Model  $H \rightarrow \mu\mu$  rare decay with ATLAS detector.



**My expertise is:**  
Programming, Modelling,  
Data analysis, Optimization.

**A problem I'm grappling with:**  
Improving sensitivity to  $H \rightarrow \mu\mu$  process.

**I've got my eyes on:**  
BSM physics

**I want to know more about:**  
Generations of matter, Neutrino mass,  
Bell inequalities, Machine learning, AI



# Jeriek Van den Abeele

*PhD Candidate at the University of Oslo  
Theoretical Particle Physics  
[jeriekvda@fys.uio.no](mailto:jeriekvda@fys.uio.no)  
[@JeriekVda](https://twitter.com/JeriekVda)*

## My research:

Dark matter phenomenology. In particular, indirect detection signatures and gravitino scenarios.

## My expertise is:

Particle physics theory (supersymmetry, dark matter, non-perturbative quantum effects), event simulations and data analysis

## A problem I'm grappling with:

Optimising Gaussian processes for big data and the sheer insufficiency of 24 hours a day

## I've got my eyes on:

Developments in the ML community, distinguishing hype and true potential (especially regarding HEP analyses), and any tools to speed up my workflow

## I want to know more about:

Python best practices, parallelisation, using TensorFlow and Keras



UiO • University of Oslo



# Wouter Van De Pontseele

Visiting research fellow at Harvard

PhD student at University of Oxford (halfway of the 3.5y)

25 years old, I have one sister and a cat called Musti.

wouter.vandepontseele@g.harvard.edu

## My research:

Measuring electron neutrinos in the MicroBooNE liquid argon time projection chamber.

## My expertise is:

Neutrino physics, google, finding cheap flight tickets, volcano's, chinese electronics

## A problem I'm grappling with:

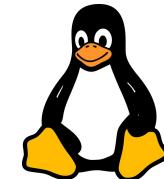
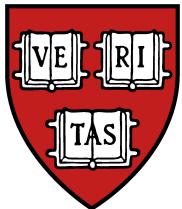
Handling data/simulation differences in classification problems.

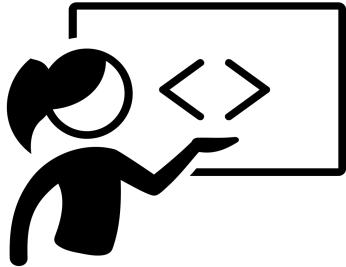
## I've got my eyes on:

Using ML classifiers for electromagnetic shower identification.

## I want to know more about:

Parallel computing, statistical models behind ML





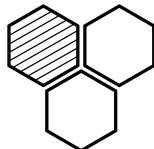
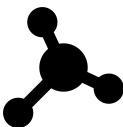
# Jay Vora

<Your title and contact details go here.

Replace images (photo above and images at the bottom) by right clicking and selecting “replace image...”. You can then drag and drop any image. This will automatically resize your image to fit the template.>

## 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:

<All text can be replaced, but for consistency we recommend the headings remain.>

## 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:

<All text can be replaced, but for consistency we recommend the headings remain.>

## I want to know more about:

<All text can be replaced, but for consistency we recommend the headings remain.>



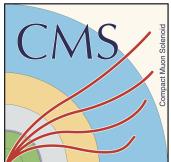


# Sean-Jiun Wang

*PhD Candidate in Experimental Particle Physics*  
*Univ. of Florida (expected Fall 2018)*  
*sean-jiun.wang@cern.ch*

## My research:

Associated Higgs production with Higgs decaying to bottom quarks



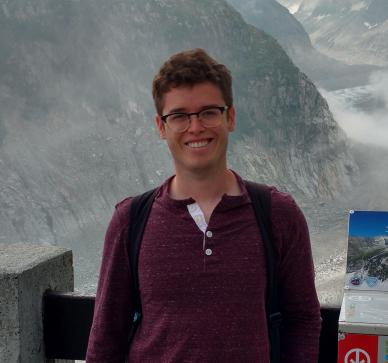
**My expertise is:**  
Higgs physics, Python programming

**A problem I'm grappling with:**  
Prospects for future employment in and out of HEP

**I've got my eyes on:**  
Muon  $p_T$  assignment using ML techniques,  
DIANA/HEP and Scikit-HEP projects

**I want to know more about:**  
General AI, but I'd settle for reinforcement learning and its applications; information security; best practices for reproducibility in science



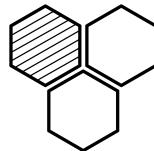
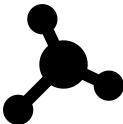


# Aaron Webb

*Ph.D. Student  
UT Austin  
ATLAS Collaboration*

## My research:

tH multilepton production, as well as differential Higgs measurements



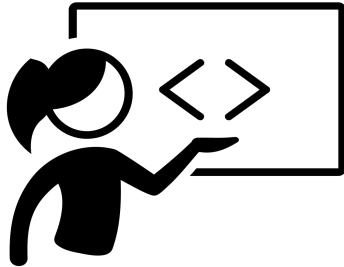
**My expertise is:**  
Higgs physics, python, xgboost

**A problem I'm grappling with:**  
Optimizing a neural net, and visualizing the results

**I've got my eyes on:**  
Integrating standard python/data science tools to work with ROOT and HEP analysis

**I want to know more about:**  
Parallel programming and code optimization





# Andrew Wildridge

*Undergraduate Student, Purdue University*  
[awildrid@purdue.edu](mailto:awildrid@purdue.edu)

## My research:

R&D of silicon detectors within the forward pixel detector for CMS with Purdue's Silicon Detector Laboratory



## My expertise is:

Client-Server architectures, Java, reverse engineering

## A problem I'm grappling with:

Embedding optimization problems into a quantum annealing framework.

## I've got my eyes on:

NLP to create an ontology of knowledge.

## I want to know more about:

Generative adversarial networks, variational autoencoders, CapsNet architecture





# Fan Xia

*Ph.D Candidate (expected Dec, 2018)*  
*University of Virginia*  
*CMS Collaboration*  
*fan.xia@cern.ch*

## My research:

Search for SUSY particle using the data collected by CMS



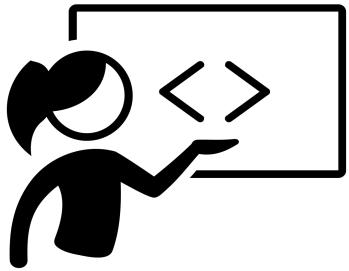
**My expertise is:**  
SUSY analysis in CMSSW, pyROOT

**A problem I'm grappling with:**  
Particle reconstruction, parallel programming for large datasets, ML application in HEP analysis.

**I've got my eyes on:**  
HEP analysis, python programming

**I want to know more about:**  
ML, parallel programming in HEP





# Yi Zhang

*PhD Candidate, University of California, Riverside*  
*Expected: 2021*  
*CMS Collaboration*  
*yi.z@cern.ch*

## **My research:**

QCD backgrounds estimation with Rebalance and Smear in searches for SUSY



**My expertise is:**  
Tools

**A problem I'm grappling with:**  
QCD backgrounds estimation and jets reconstruction

**I've got my eyes on:**  
Machine learning tools

**I want to know more about:**  
Deep learning and RNN method

