ANDREW THOMAS KENT

1 Point Street ⋄ Providence, RI 02903

(650) 714-8170 ⋄ andrew_kent@brown.edu

EDUCATION

Brown University   *September 2020 - May 2022*
Thesis: Silicon Sensor Irradiation Studies for the LHC HL Upgrade
Advisors: Professors Ulrich Heintz and Greg Landsberg
Masters of Science in Physics

University of California, Los Angeles   *September 2017 - April 2020*
Advisor: Professor George Morales
Bachelor of Science in Mathematics
Bachelor of Science in Physics

EXPERIENCE

Brown University/CERN   *September 2020 - Present*
High Energy Physicist

· Working as a researcher for Professor or Physics Ulrich Heinz at Brown University for the CMS collaboration at CERN
· Investigating the effects of neutron flux through pin diodes and DZERO diodes from FermiLab with the intent to use the knowledge gained to better understand the lifetime effects of the new silicon tracking detector for CMS (Compact Muon Solenoid) experiment at the LHC (Large Hadron Collider).
· Also irradiating small scale silicon strip sensors, from the same wafers used for the full-size sensors, and then testing their ability to directly measure electrons (and therefore muons) using a strontium source.
· Gained additional experience with wireboinding, LabView, electronics, and also cleanroom procedures which were important when working next to the silicon trackers which will be put into the new upgrade at CMS.

Inspirit AI   *November 2021 - Present*
Instructor

· Teaching an introductory but also comprehensive ML/AI curriculum to highly motivated high schoolers over a 10-day program. The curriculum includes linear and logistic regression, sentiment analysis, convolutional neural networks, and computer vision in Google Colaboratory using TensorFlow libraries, Pandas, NumPy, Sci-kit Learn, and more.

University of California, Los Angeles   *April 2018 - April 2020*
Undergraduate Researcher for Professor of Physics George Morales

· Analyzed a non-linear magnetized plasma model by writing a numerical differential equation solver, employing up to third order perturbation theory.
· Investigated the Hamiltonian of the system, and looking into dynamics such as resonant structures and trapping conditions.
· Programmed a simulation of a plasma in Matlab and python which was then compared against with the results of analytic solutions.

ACADEMIC ACTIVITIES

Quantum Winter School *December 2020*

· This school covered introductory topics in quantum computing and materials which was put on by Brown and Dartmouth University. Topics covered included qubits, gates, and measurements, circuits and algorithms, control and decoherence, and also topological quantum materials.

PROJECTS

Laboratory Measurements of Whistler Waves in an Argon Plasma *Spring 2020*

· Collected data by launching RF waves into a magnetized, cold, argon plasma. Time varying changes in the plasma were measured via a "B-dot Probe", whose data led to the analysis of the dispersion relation and damping rate (Γ)
· Investigated possible backwards and forwards resonances within the plasma.
· The data was formatted into .hdf5 files, and analyzed using python - I was then able to create a short video of the plasma wave traveling through the solenoid using the data collected at roughly 500 locations within and using a Savgol filter to interpolate between the points.

Stock Predictions using a CNN-LSTM with Self Attention *Fall 2021*

· Made a deep neural network which first uses a CNN to first get features of daily stock data (opening price, closing price, high, low, volume, etc.) and then passes that to a LSTM with a self attention layer which then predicted the future price.
· Refined the various parameters of the model by creating multiple 3D plots testing two hyper-parameters at a time against a $L2$ distance score between the predicted price and the ground truth price.

RELEVANT COURSE WORK

Graduate Courses (*Fall 2020 - Spring 2022*)

Mathematical Methods of Engineers and Physicists	Classical Theoretical Physics I & II
Quantum Mechanics I & II	Statistical Mechanics
Advanced Probabilistic Methods in Computer Science	Deep Learning

Undergraduate Courses (*Fall 2017 - Spring 2020*)

Algorithms and Data Structures	Nonlinear Differential Equations
Fluid Mechanics	Complex Analysis
Thermodynamics	Quantum Optics Lab
Electricity and Magnetism I & II	Plasma Lab
Differential Geometry	Plasma Electronics
Quantum Mechanics I, II & III	Partial Differential Equations
Probability Theory and Statistics	Abstract Algebra I & II
Ordinary Differential Equations	Real Analysis I & II

TECHNICAL STRENGTHS

Computer Languages	C++, MATLAB, Python, Root (High Energy Physics)
Tools and Frameworks	Keras, PyTorch, Tensorflow, Git
Software	LaTeX, Excel, Mathematica, LabVIEW

REFERENCES

George Morales
Distinguished Professor of Physics
Theoretical Plasma
morales@physics.ucla.edu

Sucharit Sarkar
Professor of Mathematics
Low Dimensional Topology
sucharit@math.ucla.edu

John Michael Kosterlitz
Professor of Physics
Recipient of the 2016 Nobel Prize in Physics
J_Kosterlitz@brown.edu

Robert J. Dieter
United States Ambassador to Belize 2005-2009
robertjdieter@gmail.com

ACADEMIC ACHIEVEMENTS

Recipient of the Nicholas Dieter Memorial Scholarship, awarded 2019 & 2020 by U.S. Ambassador Robert J. Dieter and Mrs. Gwynneth Dieter

EXTRA-CIRRUCULAR

- Completed the 220 mile John Muir Trail via the North-to-South route
- Completed Roper's 195 mile off-trail Sierra High Route
- Former Chef de Partie at two and three Michelin starred restaurants such as Manresa and COI
- Training to aid-climb The Nose of El Capitan in Yosemite Valley