

# Andrew Heroy

DATA SCIENTIST

Lincoln, NE

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## Skills

<b>Programming</b> (30,000+ LOC):	Python, R, VBA
<b>Programming</b> (1,000-5,000 LOC):	Jupyter(IPYNB), LaTeX, SQL, MySQL, DAX, Spark
<b>Packages</b>	NumPy, Tensorflow, Keras, Pandas, Matplotlib, Seaborn, Plotly, SciKit-Learn
<b>Tools</b>	Github, AWS, GCP, Docker, Hadoop, H2O.ai, PowerBI, Tableau, neo4j, MongoDB
<b>Machine Learning</b>	Linear/Logistic Regression, Decision Trees and Forests, Naive Bayes, Support Vector Machines, Gradient Boosting Machines, Signal Processing, Time Series Modeling, Clustering (K-means, KNN, DBSCAN, N2D), Principal Component Analysis (PCA)
<b>Deep Learning</b>	Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Generative Adversarial Networks (GAN), Long Short Term Memory Networks (LSTM), ConvLSTM, BiDirectional LSTM,

## Education

### Southern Methodist University

M.S. IN DATA SCIENCE, **GPA:** 3.91

Dallas, TX

2018 - 2020

### Kenyon College

B.A. IN PHYSICS, MINOR IN MUSIC, **GPA:** 3.7

Gambier, OH

2000 - 2004

## Projects | Research

### Stationary Exercise Classification using IMUs and Deep Learning [GitHub](#) | [Journal](#)

AUTHOR | CAPSTONE PROJECT

- Improved stationary exercise classification market using accelerometers and deep learning
- Generated own dataset using 3 LPMS-B2 9-axis Bluetooth Inertial Measurement Unit (IMU) from Zenshin Corporation
- Surveyed 28 volunteers (half male, half female) performing kettlebell swings, jumping jacks, and air squats
- Created custom Keras 5 stage tuner to survey deep learning structures up to 7 layers deep
- Evaluated over 200,000 valid deep learning model layer structures on Southern Methodist University's ManeFrame supercomputer
- Discovered that CONV LSTM2D structures most accurate and 2nd fastest model in training times
- Achieved accuracies of up to 95% using CONV LSTM2D structure
- Possible applications in the fitness, robotics, rehabilitation, and military markets
- Open source code using Tensorflow, Numpy, Pandas, and Keras
- Published to SMU Data Science Journal Review and waiting on approval from additional journals

### Cord-19-tools [GitHub](#) | [Pypi](#)

CONTRIBUTOR | MAINTAINER

- Contributor of a widely used package for processing coronavirus research
- Implemented lazy loading of research papers in python in order to reduce memory requirements
- Fully parallelized text processing, searching, and document implementation
- Smaller element of larger project building open source tools and models in order to aid in COVID research and relief, including maps used by distilling organizations worldwide in order to promote the production of hand sanitizer and code used in the Defense Intelligence Unit's dashboard for New York and Texas

### Gradient Descent [Youtube](#)

MACHINE LEARNING 2 PROJECT

- Discussed Optimizer implementation in Deep Learning
- Explanation of the mathematics behind Momentum, AdaGrad, RMSProp, and Adam Optimizers
- Explanation of Gradient Descent and why its used in machine learning

## Employment

### SMU Department of Data Science

ML MENTOR

Dallas, TX

May 2020 - Present

- TA for Machine Learning 2 course at SMU
- Help guide students through more advanced algorithms, implementing python, and learning to think critically when approaching a machine learning problem to ensure the correct methods are being applied according to the data structure, and appropriate model for that type of data.
- Revamp homeworks and presentation materials to improve learning experience for current students.

## Cobra-Puma Golf

Carlsbad, CA

SENIOR R&D TEST TECHNICIAN

March 2015 - November 2017

- Responsible for all lab measurement, club building, and robot testing. Retrofitting of measurement devices with low cost improvements.
- Eliminated paper usage in the laboratory through implementation of Excel input deck that directly connected to R&D database for improved data throughput, accuracy and reporting.
- Maintained R&D database (MySQL) to suit ever changing needs for data translation and storage. Built multiple reporting tools to extract and analyze performance/sales data using Excel/Access/VBA/MySQL/Power BI/R Code.

## Acushnet Company (Titleist)

Carlsbad, CA

SENIOR R&D TEST TECHNICIAN

November 2011 - January 2015

- Full working knowledge of Acushnet laboratory equipment and measurement techniques including: Green gauge, black gauge, Golf Labs Robot, ultrasonic thickness gauge, center of gravity, CMM, moment of inertia, COR cannon, CT machine, durability cannon, scoreline tracer, optical comparator, and Mitchell bending machine
- Built multiple platforms for lab and R&D to improve data presentation and collection using expert proficiency with Excel/Access VBA/Microsoft SQL Server
- Trained and certified with Faro 3D metrology machine. Developed processes to measure loft, lie, bulge, roll using Polyworks Software. Fully proficient in scanning and applying scan data to CAD model data to create heat map differences to check manufacturing quality

## Cleveland Golf Company

Huntington Beach, CA

RESEARCH TEST SPECIALIST

September 2005 - November 2011

- Demonstrated daily lab proficiency with standard and experimental club measurement equipment, including ball cannons, shaft durability and profiling, head measurements, and scoreline tracing
- Managed two test assistants and maintained robotic facility to evaluate club performance using Trackman radar technology (Pro and Workbench) and high speed photography (Vector and Foresight GC2 launch monitors)
- Built various instrumentation to improve testing precision and increase testing throughput, including: Golf ball incubator, flex and torsional shaft measurement systems, and laser based clubhead speed acquisition

## Awards & Honors

### SMU Data Science Outstanding Graduate Award

Southern Methodist University

WINNER

- Selected by faculty to receive outstanding graduate award
- Award signifies leadership among peers and contributions both inside and outside the classroom

### 2017-2018 Mathematical Competitive Game

Société de Calcul Mathématique SA

WINNER

- Winner of a prestigious, worldwide mathematical modeling competition involving operations research, the vehicle routing problem, and data mining
- The goal was to determine the optimal number of heating and air conditioning units delivered to a set of stores on a city grid, as well as optimize the routing and timing of daily deliveries, given the sales at each store the previous year
- Discovered temporal and spatial patterns in the sales data, built several probabilistic models of their future values
- Determined optimal daily delivery amount per shop using linear algebra, in order to ensure stores never had too few products
- Solved the vehicle routing problem using a stochastic model based on electron orbital patterns (minimization of energy, similar to simulated annealing)

## Extracurricular Activity

### University of Virginia Chess Team

Charlottesville, VA

MEMBERSHIP CHAIR

2013 - 2014

- Number 17 ranked collegiate chess player in Virginia
- Helped lead chess team to 4 consecutive state championships
- Raised membership by 400%
- Personally trained members to the level of competition of the World Team Championships, which we competed in 3 times