

Timothy Willard

Curriculum Vitae

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I'm an undergraduate physics major who is passionate about applied science, scientific computing, and science communication with strong interpersonal, leadership, and team management skills with an interest in data science and analytics.

Education

2017–2021 **Bachelor of Science**, *North Carolina State University*, Raleigh, NC.
Pursing a major in physics and planned double major with mathematics, GPA: 4.000/4.

Work Experience

- May 2018–Present **Undergraduate Researcher**, *Kemper Research Group*, Raleigh, NC.
Advisor: Alexander Kemper
- Studied critical phenomena and phase transitions of electron-hole liquids in monolayer MoS₂.
 - Used open source scientific computing tools like numpy, scipy, and matplotlib to implement and visualize technical solutions.
- Dec 2017–Mar 2018 **News Staff Writer**, *Technician*, Raleigh, NC.
- Consistently wrote and researched one to two high quality news pieces for either print or web publishing each week.
 - Maintained professional relationships with previously developed sources and developed new sources from a variety of organizations.
- Oct 2017–Dec 2017 **Assistant News Editor**, *Technician*, Raleigh, NC.
- Assisted in managing a team of fifteen to twenty news staff writers and correspondents and planned story deadlines.
 - Planned content to meet two print and two web publishing quotas each week.
 - Connected news writers with necessary human and factual sources of information for their stories.
 - Managed, edited, and assisted in recording a once a week interview podcast, *Dialogue with Technician*.
- August 2017–October 2017 **News Correspondent**, *Technician*, Raleigh, NC.
- Consistently wrote and research one to two news pieces for either print or web publishing each week.
 - Reached out to and developed professional relationships with various human sources from a variety of organizations, including from NCSU departments and student organizations.

Projects and Contributions

- August 2018–Present **Tim's Python Utilities**, *Author*.
A collection of useful python utilities, including coordinate transformations, prefitted voting classifier for ensembling, and statistics utilities for random sampling.
- July 2018–Present **Scipy**, *contributor*.
Contributed to `scipy.interpolate.{UnivariateSpline, InterpolatedUnivariateSpline, LSQUnivariateSpline}` error checking (PR 9085).

June 2018 **Dash Multi App Server**, *Author*.

Template for a Dash server that can host multiple separate applications, including support for server side multi-user HTTP authentication.

Competitions

August 2018– **What's Cooking**, *Kaggle*.

September 2018 Ranked in the top 36% with an accuracy score of 0.81275 in a Kaggle data science competition to classify the cuisine of a recipe by its ingredients. I used NLP feature engineering techniques such as TF-IDF, N-grams, and stemming. I also used various models such as ridge classifier, logistic regression, stochastic gradient descent classifier, and support vector machines (with linear, polynomial, and RBF kernels).

Technical and Personal skills

- **Programming Languages:** Python, Wolfram Mathematica. Novice in R and learning Julia.
- **Tools:** Microsoft Office, \LaTeX , Jupyter Lab, Numpy/Scipy, Matplotlib/Seaborn, Dash, Git, familiar with *NIX environments. Learning Pandas and Sklearn.
- **Soft Skills:** Critical Thinking, Project Management, Flexibility, Quick Learner, and Written and Oral Communication.

Honors and Awards

September 2018 **Provost's Professional Experience Program**, *NCSU*, Raleigh, NC.

Research grant for the study of critical phenomena and phase transitions of electron-hole liquids in monolayer MoS_2 under the advisement of Dr. Alexander F. Kemper.

August 2017–May 2018 **Dean's List for Two Semesters**, *NCSU*, Raleigh, NC.

August 2017 **NC State University Honors Program**, *NCSU*, Raleigh, NC.

June 2017 **North Carolina Academic Scholar**, *Northwood High School*, Pittsboro, NC.

September 2015 **National Honor Society**, *Northwood High School*, Pittsboro, NC.

Notable Course Work

- **University Physics I** (*Fall 2017*)
- **Honors Calculus III** (*Fall 2017*)
- **University Physics II** (*Spring 2018*)
- **Introduction to Scientific Computing** (*Spring 2018*)
- **Honors Applied Differential Equations I** (*Spring 2018*)
- **University Physics III** (*Fall 2018*)
- **Applied Differential Equations II** (*Fall 2018*)
- **Introduction to Linear Algebra** (*Fall 2018*)
- **Mathematics of Scientific Computing** (*Fall 2018*)