Davis Sandefur

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Education

MASTERS OF SCIENCE | AUGUST 2022 | UNIVERSITY COLLEGE DUBLIN

- Major: Applied Mathematics and Theoretical Physics
- Thesis: Physics of Collective Behaviour Applied to Human Opinion Dynamics
- Resuts: First Class Honours

MASTERS OF ARTS IN TEACHING | MAY 2020 | UNIVERSITY OF THE CUMBERLANDS

- Major: Physics and Mathematics
- GPA: 4.0/4.0

BACHELORS OF SCIENCE | MAY 2014 | UNIVERSITY OF NOTRE DAME

- Major: Physics
- Minor: Irish Language and Literature

Experience

RESEARCH AND TEACHING ASSISTANT | DUBLIN CITY UNIVERSITY
SEPTEMBER 2022- PRESENT

- Generated and validated over 40% of the data used in creating and training an Irish-language handwriting OCR model
- Wrote a Python script to convert thousands of pdf documents to txt, processing millions of words across a variety of genres for use in the upcoming National Corpus of Irish, based on works written after the year 2000
- Digitised and compiled metadata for 500+ folklore documents stored at University College Dublin and now available on duchas.ie
- Drafted and co-lectured a module on mathematical methods in business for students of the Gnó agus Gaeilge bachelors programme
- Taught modules on Irish language to students across all years of the language programme as well as the Gnó agus Gaeilge and Bachelors of Education bachelors
- Analysed trends in student assignments to inform teaching methods and improve overall student achievement

PHYSICS AND MATHEMATICS TEACHER | OHIO COUNTY SCHOOLS
AUGUST 2014 – SEPTEMBER 2015; JANUARY 2017 – JULY 2021

- Distilled complex topics in mathematics, physics and chemistry to students of all grades from a variety of cultural, linguistic and educational backgrounds
- Led the redesign of the 'Integrated Chemistry and Physics' curriculum which was then implemented in online and hybrid educational modes during the 2020-2021 school year, which resulted in an increase in student performance of approximately 30%
- Created a Python-based application for two departments to automate various aspects of grading and test generation, as well as to infinitely generate new problems, saving five or more hours a week

- Utilized Python scripts to promote visualization of complex topics, ==such as particle motion and animated graphs of non-parallel lines becoming parallel==, increasing classroom engagement
- Core member of the Night of the Arts Committee, promoting the artwork of hundreds of local students and residents of Ohio County, Kentucky
- Counseled over 100 students on career and university opportunities after secondary school, discussing study abroad options, student loans and four-year academic plans for high school

BUSINESS OPERATIONS ANALYST | US BANK HOME MORTGAGE
September 2015 – July 2016

- Ran daily data processing on over a 1000+ loans a day to conform to internal standard format
- Generated, ran and delivered over 100 reports a month on loan onboarding, foreclosures and payments
- Programed 40% of new loan boarding system to ensure timely switch to new system of operation
- Created three new Access databases using SQL and VBA modules to ensure optimal processing of new loan data for an efficiency increase of over 50% from the previous methods
- Developed a 'change log' database to track when changes to various systems are programmed, tested and implemented, increasing programming efficiency team-wide by over 10%

Projects

ANALYSIS OF 2016 IRISH CENSUS
- Used pandas, scikit-learn and numpy to analyze the 2016 Irish census for 'Data Programming in Python' module
- Pre-processed and cleaned data using pandas and numpy
- Calculated statistics relating to multilinguals in Ireland in regards to educational background, socioeconomic class and location in the country
- Ran principal component analysis and linear regression to see what features enabled us to predict the number of second language speakers in an area
- Applied Gaussian Naive Bayes and Neural Networks with the scikit-learn library to try to predict which areas of Ireland had over 50% daily Irish speakers, achieving a success rate of over 70% with a neural network
- Analyzed the discrepancy between areas which claimed to speak Irish versus the areas with a high percentage of daily speakers

ANALYSIS OF IRISH SUMMER 2021 HEAT WAVE
- Programmed a script to automate gathering historical forecast data from Met Éireann, fast tracking the project by several weeks
- Created and ran numerical models to forecast the weather from historical data
- Analyzed historical data, self-run forecasts and an international meteorological dataset using numpy and scipy
- Achieved a success rate of over 80% between self-created model and actual meteorological events
- Visualized the meteorological data in various contexts using matplotlib, cartopy and seaborn

Awards

FULLBRIGHT GAELTACHT SUMMER AWARD

· Awarded in the summer of 2016 to spend six weeks immersed in

Skills

TECHNOLOGY

· Python ((geo)pandas, numpy, scipy, scikit-learn, matplotlib, seaborn, cartopy, xarray)
· Linux
· SQL
· Javascript
· Version control (Git)
· Microsoft Office Suite

LANGUAGE

· English (native)
· Irish (Teastas Eorpach na Gaeilge B2)
· French (lower intermediate)