Joe Conroy

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Education

BSc in Mathematics and Computer Science
Northeastern University

Skills

Languages: JavaScript/TypeScript, Python+Django, HTML+CSS, SQL, VBA, regex, LaTeX
Software: git, Linux, Excel, Mathematica, SageMath

Experience

Fitness Consultant / Freelance

- **Application development:** Wrote a client-exclusive weightlifting log application with Django+JavaScript frontend and MySQL backend to track gym sessions and visualize progress.
- **Sales and business development:** Sold training and fitness program management to prospective clients through a personal brand. Maintained high conversion rates and low monthly churn. Provided remote and in-person consultation, as well as on-call coaching for training questions or support.
- **Synthesised research and practical experience**: Combined current research in physiology and nutrition from PubMed and other databases with tacit knowledge to provide actionable advice tailored for individual clients.

Junior IT Analyst / Burke Distributing Corporation

- **Launched automated account retention program:** Designed and executed first-ever client survey for 7,000 accounts through a number of automation strategies. Improved response rates with light-touch follow ups and predicted account churn by identifying negative responses.
- **Performed cohort and customer segmentation analysis:** Analyzed survey data and presented findings to senior management. Helped relevant departments recognize strengths and weaknesses to develop competitive edge.
- **Social growth management:** Drove YoY corporate social media performance growth with smart analytics monitoring and content strategy development.
- **Developed ETL for deploying new inventory data:** Processed brand catalog database revisions for the successful rollout of a new company inventory portal, driving up lifetime customer value for new and existing accounts.

Personal Care Assistant / Cerebral Palsy of Massachusetts

- **Assisted elderly in daily life**: Planned meals based on individual needs and medical conditions, performed housekeeping tasks and general quality-of-life improvements, and kept them company.

Projects

Abelian Sandpile Model: TypeScript app to manage state of generic 2D cellular automata, and animate their evolution via the HTML5 Canvas API. Implements Presentation-Abstraction-Control pattern for modularity and separation of concerns. As a demonstration, it animates the Abelian Sandpile (demo: https://jamais-vu.github.io/sandpile/).

Conway's Game Of Life: Game of Life web app supporting a variety of user interactions, built from scratch in JavaScript and HTML+CSS (app: https://jamais-vu.github.io/gol-webapp/).

Weightlifting Log: MySQL database with Django+JavaScript frontend for users to track gym sessions and visualize progress. Supports manual entry, bulk text import via Python lexer+parser, and iOS Apple Health import via XML parser.

markov-analysis: Markov chain n-gram model to generate text in the style of a given corpus.

caesar-cipher: Python implementation of a Caesar cipher for arbitrary Unicode code points.

insert-date: Sublime Text 3 plugin to insert the current date or time at the cursor.

An Algorithmic Approach to Commuting Nilpotent Matrices: Undergraduate mathematics research on properties of commuting nilpotent matrices. Optimized workflow by using SageMath for symbolic algebra computations and automatically generating LaTeX documentation from SymPy outputs. Summarized the state of current research and presented my work at a department meeting, in a manner understandable for an audience with general mathematical background.

Last.fm recommender system and network analysis: Implemented similarity metrics and recommender systems from scratch in Java. Fetched user and artist data via Last.fm API, and used Gephi to perform network analysis and produce graph visualizations of artist/tag popularity and strength of connections.