Christopher David Armstrong

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Developer and Data Analyst with 5+ years of data and applied mathematics experience. 3+ years of experience in database languages (Python, R, SAS, SQL) and web languages (CSS, HTML, JavaScript, jQuery, PHP, XML). Demonstrated ability to perform data analysis and produce project documentation. Strong requirements assessment, statistical, systems design, quantitative, and analytical skills. Core competencies in Excel, Python, R, and SQL.

Experience

Developer and Data Analyst *September 2014 – Present*

Armstrong Consulting – Washington, DC

- Developed a user interface to help a client transition away from an Excel-based to a MySQL-based data management system. Reduced job time for the client by 60%, partially by automating data retrieval from IRS servers so that the client would not need to rely on external data stores. Programmed a script to automatically condense 100+ page PDFs into 4 page PDFs so that the client would not have to spend time opening and scanning for information. Developed meta tag and ranked search systems to increase database search speed. Languages used include CSS, HTML, jQuery, JavaScript, PHP, Python, and SQL.
- Coded python scripts, automating the data ingestion process between the client and external data servers, reducing the client's data ingestion time from a week to one day. Coded automation scripts to transact between the client's servers and external FTP servers, freeing up time for the client to work on other tasks. Languages used included Bash, MySQL, and Python.

Mathematics Teacher *October 2013 – October 2016*

Revolution Prep – Washington, DC

- Prepared high school students for standardized college admissions examinations by teaching online and in-person courses, emphasizing mathematical competencies. Improved test-taking performance by using statistical system to support student learning plans.
- Developed mathematics curricula and followed session documentation procedures. All students improved at least 200 points and 3 points for the SAT and ACT respectively.

Assessment Data Analyst (Contract) *March 2014 – August 2014*

The University of the District of Columbia – Washington, DC

- Implemented performance measurement systems to track student performance over the course of workforce development programs, specifically using the CASAS and TABE assessments as data information centers.
- Performed data research to improve student retention, using MS Access and Excel extensively. Efforts led to 10% increase in student retention. Developed mathematical intelligence reporting system and curricula for low-income learners, focusing coursework on home- and occupationally-based mathematics. Formulated school- and state-compliant admission requirements and specifications for workforce development programs.
- Hired and managed an intern statistician. Produced 56-page study detailing core areas of strength and weakness in curriculum of the workforce development programs and entrance assessments. Report was used by subsequent instructors to provide learning tools to new students.

XML Specialist *July 2012 – July 2013*

Allen Press – Lawrence, KS

- Volunteered to conduct two-week observation and data collection of co-workers to develop typesetting tools and process improvements, focusing on workflow reporting systems. Produced Excel model for management with suggested workflow modifications that saved company approximately $300,000 per year.
- Implemented statistical system to support Quality Control Supervisor, resulting in a 20% reduction in production time for clients. Utilized XML schema to produce manuscripts for academic journals and private clients.
- Developed Typesetting Specifications and Quality Assurance User Manual for future employees, focusing on client technical needs. Assisted supervisor and other departments with the enforcement of documentation procedures.

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Mathematics Teacher *January 2008 – May 2013*
Accelera Tutoring Services – Lawrence, KS

- Taught high school and university students in mathematics by assisting with homework and test preparation. Courses taught included pre-Calculus, Algebra, Business Calculus, Differential Equations, Engineering Calculus, Geometry, Statistics, and Trigonometry.
- Conducted group review sessions and wrote mathematics tutorials. Developed website to allow students the ability to track their progress. Created secure login system using MySQL, PHP, and SSL. Created session dashboards with CSS, HTML, MySQL, and PHP to allow students to access session notes. All students progressed up to two letter grades, with 3 students going on to become tutors themselves.

Education

B.S., Mechanical Engineering
The University of Kansas – Lawrence, Kansas

- Gained experience in developing, gaining approval for, and implementing projects that improve efficiency and reduce costs through senior design project in alternative energy. Delivered report to Mechanical Engineering department based on own independently-conducted research detailing the efficacy of hydrogen as an alternative energy source.
- Led 4-person team in redesigning a hypothetical steam power plant to improve system efficiency and reduce costs. Performed data analysis and produced Excel model which resulted in an operating cost reduction of $100,000/year and 50% reduction in carbon dioxide emissions. Developed Excel model of 4-stroke engine, implementing complex algorithms to calculate power efficiency and fuel consumption.
- Relevant Coursework: Applied Statistics I; Computational Numerical Analysis; Data Methods; Computer Graphics; The Finite Element Method for Stress Analysis; Microeconomics I; Macroeconomics I

Continuing Education and Certificates

SAS Programming I *June 2015*
The SAS Institute – Washington, DC

- Completed course as part of the SAS certification track. Topics included: database creation, management, and operations; report generation; graphics export; ANOVA; Regression; and Logistic/Multiple Logistic Regression.

Applied Statistics II *December 2014*
Northern Virginia Community College – Alexandria, VA

- Completed course focused on applications of statistical models to real-life problems. Topics included: estimation and hypothesis testing with emphasis on correlation and regression; analysis of variance (ANOVA); chi-square tests; and non-parametric methods.
- Designed and conducted statistical survey on exercise habits of internet users, presenting data findings to course instructor and classmates.

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Quantitative Portfolio

Selected Algorithms

Multivariable Extrema Algorithm *July 2016*

Written in R – 700 lines

- Developed algorithm which minimizes transcendental functions of several variables, using strict convergence criteria. Possible applications of algorithm include weather simulations, modelling of physical phenomena, and root-finding for differential equations.

Fuzzy Logic Keyword Comparison Package *July 2015*

Written in R – 1,500 lines

- Developed software that allows user to compare word lists with options for scoring and ranking word matches.

Combinatorial Calculator *July 2015*

Written in R – 1,200 lines

- Developed algorithm to compute all possible permutations in a nurse assignment-type optimization problem.

Report Generator *July 2014*

Written in Excel VBA – 300 lines

- Created analytic spreadsheet to perform aggregation on student attendance and performance data.

Selected Papers and Reports

Armstrong, Chris. *A Study of Superpositions of Periodic Functions (Pure Mathematics - Real Analysis)* (in progress). Article.

Armstrong, Chris. *Partial Proof of the Lonely Runner Conjecture - Integer Speeds of Certain Classes (Pure Mathematics - Real Analysis).* Article. Washington, District of Columbia: Self-Published*, 2016. Print. 4 pages.

Armstrong, Chris. *Existence and Uniqueness of Solutions to Linear Differential Equations of a Particular Form Subject to a Linear Constraint (Pure Mathematics - Partial Differential Equations).* Monograph. Washington, District of Columbia: Self-Published*, 2016. Print. 25 pages.

Armstrong, Chris, and Matthew Hiesiger. *Statistical Analysis of Assessment Scores at the Marion Shadd Workforce Development Site*. Report. Washington, DC: Self-Published, 2014. Print. 56 pages.

Armstrong, Chris. *A Statistical Analysis of Production Floor Delivery Time Efficiency at Allen Press*. Report. Lawrence, Kansas: Self-Published*, 2012. Print. 4 pages.

Armstrong, Chris, and Max Ward. *Modeling and Optimization of a 4-Stroke Engine Using Excel*. Technical Paper. Lawrence, Kansas: University of Kansas, 2009. Excel Media. 5 pages.

Armstrong, Chris, and Max Ward. *A Theoretical Design of a Combined Cycle Steam Power Plant*. Technical Paper. Lawrence, Kansas: University of Kansas, 2009. Print and Excel Media. 10 pages.

* Contents of paper or report are not available for disclosure.