Joseph W. Clark, Ph.D

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CAREER PROFILE:

I'm an experienced senior software developer, with a professional background in Java, JavaScript, and Python, among others. I've also been coding in Rust for about 5 years, and would like to make it a larger part of my work.

My specialty over the past several years has been enterprise-scale Java systems, maintaining and fortifying legacy systems as well as (re)engineering new systems in modern frameworks and architectures (e.g. Spring Boot, microservices, Angular). I'm also a former academic with a background teaching and researching data analytics, machine learning, and statistics – and I still teach and write on the side. With these skills, and this knowledge, I am a versatile engineer who can be effective in all kinds of contexts.

Areas of Expertise:

- Rust programming including blockchain, cryptography, simulation and procedural generation.
- Maintaining legacy enterprise Java applications such as those written in the Struts framework: navigating a complex code base, maintaining and updating functionality, and documenting and refactoring opportunistically to make those applications more maintainable in the future.
- Engineering new Java applications in modern frameworks, such as Spring Boot.
- Architecture of modular systems (e.g. microservices) using REST APIs and containerization (Docker).
- Carefully implementing DevOps with version control, unit testing, automated builds and deployment.
- Front-end development with HTML/CSS and JavaScript (TypeScript) frameworks (Angular, Vue).
- Database modeling and SQL, including data warehousing and ETL.
- Experience in other languages and frameworks, including Python.
- Project planning and Agile project management.

TECHNICAL PROFICIENCIES

Operating Systems	Microsoft Windows, MacOS, and Linux
Languages	Rust, Java, Python, JavaScript, Typescript, HTML, CSS, SQL, PL/SQL
Java Frameworks and Libraries	Spring Boot, Struts, JUnit 5, Tomcat
Front-end Frameworks	Angular, Vue, JQuery, D3.js, Highcharts, Thymeleaf, Flask
DevOps	Cargo, Maven, Angular CLI, npm, Toad, Postman, Docker, GitHub, Jira, Bitbucket, SonarQube, Jenkins
Databases	Oracle, PostgreSQL, SQL Server, MongoDB
Analytics Software	Tableau, Excel, LibreOffice Calc, Spyder, pandas, numpy, matplotlib

PROFESSIONAL EXPERIENCE

Adsync Technologies / Naval Sea Logistics Center Portsmouth, Kittery, ME **05/2021 - Current**
Senior Java Engineer

Adsync is a contractor providing high-end engineering talent to the U.S. Navy. I work at NavSeaLogCen on an engineering team that develops and maintains PDREP, an extremely high-traffic enterprise system supporting supplier performance information, providing significant cost avoidance and overall savings to DoD and the Navy.
***Key Achievements**:*

- Work with analysts and DBAs to develop requirements, fix problems, and implement new features in PDREP, a massive Java enterprise application written in the Struts 2 framework.

- Re-engineered core parts of the legacy application to add important new functionality where security was of utmost importance: including a new way of authenticating to the Oracle database and a new API-based single-sign-on feature for users coming from another DOD application.
- Developed PDREP's first microservice application, a new module that utilizes a Spring Boot backend, JSON APIs, and Angular front-end. This has served as a prototype to be followed by the rest of the team in a gradual rewrite of the entire enterprise system.
- Rewrote a legacy application from scratch, replacing ~38,000 lines of legacy code with ~2500 lines of clean, well-documented, testable code to ensure long-term sustainability of the application.

Environment: Java 21, Angular 17, Oracle, PL/SQL, Tomcat, JSP, Jenkins, SonarQube.

Collegium Sanctorum Angelorum, Kansas City, MO (Remote) **08/2024 - Current**
Adjunct Faculty

This brand-new Catholic college recruited me to teach a Statistics course for their first senior class – one student – in 2024, and a Python-based computer science course as part of their mathematics curriculum.

Farmington Fire Rescue, Farmington, ME **11/2020 - 11/2024**
On-call Firefighter

As an on-call (volunteer) firefighter for four years, I responded to structure fires, traffic accidents, floods, etc., for my home town fire department and nearby communities.

- Earned Firefighter I and II certification, and maintained air pack (SCBA) qualification.

State of Maine Office of Information Technology, Augusta, ME **05/2019 - 05/2021**
Senior Programmer Analyst

With one other developer, I maintained the MOSES system, a Java and Oracle application which processes all hunting and fishing licenses, ATV and snowmobile registrations for the State of Maine Department of Inland Fisheries and Wildlife, bringing in about $30 million in revenue to the State annually.

Key Achievements*:*

- Having previously worked mostly in Python, I quickly got up to speed in the Java language and its ecosystem tools such as Maven and JUnit. As part of re-training, I had a chance to read up on design patterns, unit testing and integration testing, and put these into practice in my work on MOSES.
- Worked with end users and agency representatives to identify requirements and design new features, then develop them within a large, complex code base.
- Created SQL queries and PL/SQL procedures in our Oracle database backend.
- Managed security-related patches and Java version updates, testing and refactoring software to work with new versions.
- Re-engineered the MOSES build process to use Maven and Docker.
- Developed extensive Java unit tests in JUnit 5, as well as integration tests and end-to-end tests, including some that employed Docker to spin up temporary databases for testing.
- Completely rewrote a module of MOSES in Spring Boot with a Thymeleaf template front-end.
- Helped the Office of IT experiment with GitHub Enterprise, producing a series of training screencasts to teach other developers how to use GitHub Actions for CI/CD.
- As a member of a rapid-development team, worked with other developers to quickly prototype a new application (FSMA) for the Dept. of Agriculture, Conservation, and Forestry using Vue.js.

Environment: Java 11, Tomcat, Oracle, PL/SQL, HTML, CSS, Ant, Spring Boot, Maven, JUnit, Vue.js.

Lie-Nielsen Toolworks, Warren, ME **08/2016 - 01/2019**
Analytics Developer

As a freelance consultant over a little more than two years, I developed a wide array of data analysis and visualization tools for this famous Maine manufacturer of heirloom-quality woodworking tools.

- Developed dashboards in Python, using the Flask framework and HTML/CSS/JavaScript templates, in most cases making complex queries of the company's PostgreSQL-based ERP system (Fulfil.io) and presenting that data in interactive tables and data visualizations.
- Modeled an analytical data warehouse (using dimensional modeling) for quick analytical querying of large datasets, and developed ETL processes from scratch.
- Developed JavaScript-based front-ends for some of these analytics tools, using Angular and D3.js.
- Trained and mentored new developers on Lie-Nielsen's staff.

Environment: Python, Flask, Jinja2 templates, HTML, CSS, JavaScript, Typescript, Angular, PostgreSQL, SQL.

University of Maine, Orono, ME **08/2016 - 05/2019**
Lecturer in Management Information Systems

- Taught undergraduate courses in information systems and a graduate course in statistics.
- Developed and taught a special topics course on data visualization and decision analysis.
- Represented the Maine Business School by presenting research at international conferences.

Arizona State University, Tempe, AZ **08/2013-05/2016**
Clinical Assistant Professor

- Taught undergraduate courses in agile project management, and in databases and SQL.
- Helped develop one of the nation's first undergraduate majors in business analytics.
- Wrote an e-book on "data engineering" and delivered an online course on Big Data for the Indian School of Business in Hyderabad, India.
- Represented ASU by presenting research at international conferences

University of Nebraska at Omaha, Omaha, NE **08/2012-07/2013**
Visiting Research Associate

University of Southern California, Los Angeles, CA **2007-2012**
Ph.D Candidate and Research Assistant

China Agricultural University, Beijing, China **2006-2007**
Lecturer, International College

Walt Disney Internet Group, Burbank, CA **2000-2001**
Senior Web Site Integrator

MediaPower Inc, Portland, ME **1999-2000**
Web Development Specialist

NBC.com, Culver City, CA **1997-1999**
Web Site Integrator

EDUCATION, CERTIFICATIONS AND TRAINING

- Doctor of Philosophy (Ph.D), University of Southern California Marshall School of Business, 2012
- Master of Business Administration (MBA), Tulane University, 2004
- Bachelor of Arts, University of Southern California, 1999
- Certifications and Training:
  - **CompTIA Security+** certification, (2019, good until 2025)
  - Federal **security clearance** (2021)
  - Certified ScrumMaster (2013-2016)
  - Amateur Extra class FCC license (ham radio call sign: AC1JO)
  - Firefighter I & II, Maine Fire Service Institute

BOOKS WRITTEN

- (2016) *A Data Engineer's Manual*. [E-book] Leanpub. https://leanpub.com/data-engineers-manual
- (in progress) *Relating to the Database*. [E-book] Leanpub. https://leanpub.com/relating-to-the-database

SELECTED OPEN-SOURCE CODE:

To examine any of these projects (and more), browse my GitHub profile: https://github.com/joeclark-phd.
My public Rust crates can be found on crates.io here: https://crates.io/users/joeclark-phd.

- `multimarkov`: (https://crates.io/crates/multimarkov)
  A Rust crate providing multi-order Markov chain models for procedural generation applications.

- `markov_namegen`: (https://crates.io/crates/markov_namegen)
  A Rust create offering tools for generating random text using Markov models.

- `bufferbuffer`: (https://crates.io/crates/bufferbuffer)
  A Rust implementation of the Double Buffer design pattern.

- `simplechain`: (https://github.com/joeclark-phd/simplechain)
  An experiment in coding a "generic" blockchain in Rust that can store any kind of serializable data.

- `blockachain`: (https://github.com/joeclark-phd/blockachain)
  An experiment in coding a simple blockchain in Java.

- `merkletree`: (https://github.com/joeclark-phd/merkletree)
  A simple implementation of a Merkle Tree for efficiently verifying that a large data set hasn't been tampered with, in Java.

- `markovmodels`: (https://github.com/joeclark-phd/markovmodels)
  A Java library providing multi-order Markov chain models for procedural generation applications.

- `random-text-generators`: (https://github.com/joeclark-phd/random-text-generators)
  A Java library for procedural generation of random text based on Markov models.