Qingwei Zhang

SDET | Python Test Automation, CI/CD, Pytest

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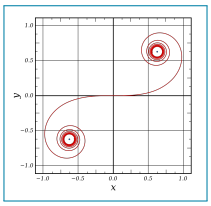
Canadian Citizen | Based in Ottawa, ON |
Open to remote roles in Canada and the U.S.



Summary

SDET with hands-on experience building Python-based automation frameworks, CI-integrated pipelines, and validation tools across embedded and distributed environments. Focused on improving software reliability, enabling continuous integration, and scaling automated regression to reduce manual QA effort. Strong background in C++/Python testing and system debugging. Skilled at delivering stable, production-ready test infrastructure.

Technical Skills

- **Languages:** Python (Pytest, unittest, coverage), C++ (GoogleTest), Bash
- **CI/CD & DevOps:** Jenkins, GitHub Actions, GitLab CI, automated build & deployment pipelines
- **Test Automation:** Framework design, integration testing, fixtures/mocks, regression suites, coverage analysis
- **Tools & Infrastructure:** Docker, Linux, REST API testing, log validation, parallel test orchestration
- **Validation Domains:** Embedded systems, OTA update testing, backend service validation, cross-platform regression
- **Concepts:** Fault isolation, reliability engineering, concurrency testing, automation metrics, defect triage

Experience

2020–2025 **Software Development Engineer / SDET**, *Ford Motor Company*, Ottawa, Canada
- Designed and maintained a Python-based automated validation platform for HMI systems across 20+ ECUs, cutting manual test time by 35% and report latency by 24%.
- Refactored C++ diagnostic test modules to improve stability and reduce memory footprint by 18%.
- Led CI/CD integration for OTA validation pipelines, enabling nightly distributed regression and automated fault reporting.
- Improved suite stability and flaky test governance through deterministic test data, retry/isolation strategies, and structured log/artifact retention for root-cause analysis.

2019–2020 **Software Engineer**, *Wannlynx (acquired by Circle K)*, Ottawa, Canada
- Increased system uptime from 94% to 99.7% by developing embedded C++ watchdog and payment modules for 400+ Linux-based retail terminals.

2015–2018 **Co-founder & Technical Lead**, *Hua Da Advertising (Startup)*, Guigang, China
- Improved ad delivery reliability by 90% by building a remote system for 100+ LED screens with auto updates, smart scheduling, and offline fault tolerance.

Education

MASc, 12/2012 **University of Ottawa**, *Master of Applied Science (MASc) in Electrical and Computer Engineering*, Ottawa, Ontario, Canada
Awards: uOttawa Research Assistantship, covering 60% of tuition fees.

BE, 07/2009 **Guilin University of Electronic Technology**, *Bachelor of Engineering (BE) in Computer Science*, Guilin, Guangxi, China
Awards: EECS Bachelor's Thesis Award; China National Scholarship (Top 1% nationwide, 80% tuition covered)

Projects

- **HMI Regression Test Framework (Python)** — Developed a Pytest-based automation framework for validating infotainment UI in electric vehicles.
  - Automated multilingual interface validation, touch input simulation, and audio/visual checks.

- Reduced manual verification time by 40% and improved consistency across 20+ ECU variants.

- **OTA Automation Scheduler (Python)** — Built a multi-bench regression scheduler using YAML-defined test jobs, concurrency management, and real-time Slack notification integration.
  - Designed concurrent execution model for distributed regression testing with job queuing and prioritization.
  - Integrated with Jenkins CI for nightly validation and automated report generation.
- **OrderBookEngine (C++)** — Open-source multithreaded order matching simulator built with GoogleTest for regression validation.
  - Implemented automated unit and integration tests covering order matching, cancel/modify events, and concurrency edge cases.
  - Designed GoogleTest-based coverage and CI integration; validated performance under 20K-order benchmark scenarios.
  - GitHub: zqw86713/OrderBookEngine

Open Source Contributions

- **TensorFlow (C++)** — Contributed C++ test and robustness improvements to a large-scale open-source computation framework.
  - PR #96429: Strengthened input validation in `proto_splitter()` to prevent crashes from malformed Protobuf data; added targeted unit tests for negative-path coverage.
  - PR #96866: Fixed a segmentation fault in DTensor constant folding by enforcing null-safety checks and extending test coverage for error handling.

Highlights

Citations in Patents

Cited in U.S. patents filed by Fortune Global 500 companies, my research shows direct industry impact.

- **Hitachi (Japan)** — Patent No. 10389734, citing work on RFID key management (IEEE LAT)
- **Motorola (U.S.)** — Patent No. 8826006, citing work on certificate revocation (IEEE ISCC)

Certifications

- Security Clearance: Canada Reliability Status
- CFA Level I: Passed in 2018

Honors

- 2021: Recognized by Ford for contributions under the "Built Ford Tough" initiative
- 2014: Co-founded the IEEE IAS Ottawa Chapter

Affiliations

- IEEE: Member since 2012
- ACM: Member since 2012

Scholarly Review

- 2014 – 2019: Reviewer for IEEE TVT, IET ITS, and other peer-reviewed journals

Conference Presentations

- 2012 – 2013: Presented certificate revocation work at MoWNeT 2013 (Montreal) and NSERC DIVA 2012 (Ottawa)

Last Revised: November 8, 2025.