

# Matthew J. Barichello

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LEAD SOFTWARE ENGINEER

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## Experience

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March 2022	- December 2023	<b>NowSecure (Lead Software Engineer)</b> , <i>Chicago</i> <ul style="list-style-type: none"><li>• Built out and lead a dedicated NowSecure Platform infrastructure engineering team</li><li>• Developed and deployed new backward-compatible virtual device security testing frameworks in a kubernetes-native microservice environment</li><li>• Built out infrastructure monitoring and reporting frameworks using DataDog and active service instrumentation</li><li>• Developed architectural design documents, modernization plans and standards guidelines</li></ul>
August 2021	- March 2022	<b>Ford (Fullstack Software Engineer)</b> , <i>Dearborn, Michigan</i> <ul style="list-style-type: none"><li>• Developed and deployed enterprise-grade vehicle insights SaaS products, backed by Big Data solutions</li></ul>
March 2020	- February 2021	<b>Sensibill Inc. (Security Champion)</b> , <i>Toronto, Ontario</i> <ul style="list-style-type: none"><li>• Introduced proactive security standards for engineering teams</li><li>• Deployed new CI-coupled security infrastructure for source and dependency vulnerability detection and quality gating</li><li>• Deployed new active infrastructure monitoring utilities for behavioural anomaly detection, resource load monitoring and real-time attack detection</li></ul> <b>Sensibill Inc. (Data &amp; AI Researcher)</b> , <i>Toronto, Ontario</i> <ul style="list-style-type: none"><li>• Built out bleeding edge heuristic data extraction models in Typescript and Python that powered the development and release of multiple new Extraction-as-a-Service (EXaaS) products</li><li>• Created real-time data segmentation prototypes based on graph clustering to select the appropriate model(s) for optimal data extraction</li><li>• Created and maintained data annotation tooling</li><li>• Handled production model deployments</li></ul>
December 2019	- March 2020	<b>Sensibill Inc. (Backend Engineer)</b> , <i>Toronto, Ontario</i> <ul style="list-style-type: none"><li>• Developed a set of scalable RESTful microservices in Golang and Java, backed by a scalable asynchronous message query platform</li><li>• Created and provisioned cloud architecture using IaC on AWS</li><li>• Managed a private CI and CD platform using IaC on AWS</li></ul>
May 2019	- March 2020	<b>Optimotive Technologies (Contractor)</b> , <i>Windsor, Ontario</i> <ul style="list-style-type: none"><li>• Contractor for electrical design and software development</li></ul>
March 2019	- March 2020	<b>No Generics Ltd. (CEO)</b> , <i>Belle River, Ontario</i> <ul style="list-style-type: none"><li>• Scalable cloud virtualization with a 10Gbe intranet back-plane for high-throughput storage access</li><li>• Game server hosting with segregated virtualization containers and isolated networking</li><li>• Software development and electrical design contractor</li></ul>
February 2018	- June 2019	<b>Programming and Computer Science Tutoring</b> , <i>Assumption College High School</i> <ul style="list-style-type: none"><li>• Private online Java programming tutoring during weekdays after school</li><li>• In-class Java programming and computer science conceptual tutoring</li></ul>
September 2015	- June 2017	<b>Programming and Electrical Design Mentor</b> , <i>Assumption Robotics Club</i> <ul style="list-style-type: none"><li>• Taught and mentored Java and C programming as well as circuit design and implementation in robotics</li></ul>

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## Languages & Frameworks

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Cloud Platforms	AWS; Azure; DigitalOcean; OVH; LunaNode
Cloud Frameworks	PrismaCloud; SonarQube; Instana; DataDog
Big Data	Apache Hadoop; Apache Spark; Grafana
CI/CD & Automation	Kubernetes; GitLab; GitHub Actions; CircleCI; Jenkins; sr.ht
IaC	HCL Terraform; Chef; AWS CDK
Languages	C++; C; Go; Java; Kotlin; Groovy; TypeScript; JavaScript; Bash; m4; <del>TEX</del> ; Rust; Python; Lua; Pascal
Operating Systems	Windows; macOS; Linux (Debian & derivatives; Red Hat & derivatives; Arch)
Frameworks	OpenCL; OpenGL; Apache Commons; Processing; JNI; Coreutils; KVM; QEMU; LUKS; Systemd; Init; Cron; iproute2; iptables; docker
Build Tools	Gradle; Maven; Ant; CMake; GNU/Make; Autotools; Waf

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## Education

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August 2019	<b>Quantum Cryptography School for Young Students</b> <i>University of Waterloo</i>
September 2015 - July 2019	<b>Ontario Secondary School Diploma</b> <i>Assumption College High School</i>
	<b>International Baccalaureate Certificate</b> <i>Assumption College High School</i>
July 2015	<b>DMA Certificate for Advanced Java Programming</b> <i>University of Toronto</i>

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## Projects

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February 2019 - present	<b>CX</b> - C++, CMake <ul style="list-style-type: none"><li>A header-only, stl and libc independent, C++20 concepts, template meta-function and runtime utility library. Features include advanced compile-time traits, zero-allocation generic runtime closures, deferral and error handling mechanisms, and much more.</li></ul>
January 2019 - present	<b>fake-jni</b> - C, C++, CMake, JNI, JVMTI <ul style="list-style-type: none"><li>A JNI and JVMTI instrumentation and interposition framework. Features include platform agnosticism, JNI-header agnosticism, a high-level JNI and JVMTI interposition API, seamless native class and function definitions, advanced JNI and JVMTI API boundary profiling and much more.</li></ul>
September 2019 - present	<b>baron</b> - C, C++, CMake, JNI, JVMTI <ul style="list-style-type: none"><li>A reverse engineering framework built on top of <b>fake-jni</b> designed to be a mostly automatic black-box JNI module and JVMTI agent runtime disassembler.</li></ul>
December 2021 - present	<b>constemu</b> - C++, CMake <ul style="list-style-type: none"><li>A constant-expression compatible NMOS6502 microprocessor emulator, including special cases for invalid instructions and special behaviours of later reproduction runs.</li></ul>
January 2020 - January 2020	<b>go-figure</b> ( <i>Sensibill</i> ) - Golang <ul style="list-style-type: none"><li>A runtime micro-service configuration bus designed to allow for zero-downtime configuration changes in critical and production environments. Supports both synchronous and asynchronous configuration busses.</li></ul>
	<b>go-locals</b> ( <i>Sensibill</i> ) - Golang <ul style="list-style-type: none"><li>A goroutine identification and threadlocal library.</li></ul>
	<b>roam</b> ( <i>Sensibill</i> ) - Golang <ul style="list-style-type: none"><li>A much faster alternative Golang static reflection runtime. Addresses issues in the default Golang reflection runtime that causes reflective access operations to take several orders of magnitude longer than they should.</li></ul>
	<b>gomains</b> ( <i>Sensibill</i> ) - Golang <ul style="list-style-type: none"><li>A lightweight and fast runtime struct serialization and deserialization framework, built on <b>roam</b>.</li></ul>

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## Competitions

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March 22-23, 2019	<b>Massey Hacks V</b>
February 1, 2019	<b>Woburn Challenge Online Round 3</b>
December 14, 2018	<b>Woburn Challenge Online Round 2</b>
December 7, 2018	<b>15th Windsor Regional Secondary School Programming Competition</b>
November 16, 2018	<b>Woburn Challenge Online Round 1</b>
September 14-16, 2018	<b>Hack the North 2018</b>
April 28-29, 2018	<b>Massey Hacks IV</b>
April 1-2, 2017	<b>Massey Hacks III</b>
May 21-22, 2016	<b>Massey Hacks II</b>

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## Awards

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2022	<b>Value Creation Award, Craftsmanship, <i>NowSecure</i></b>
2018	<b>First Place Programming Team Award, <i>University of Windsor</i></b>
2018	<b>First Place Hacker, <i>Massey Hacks IV</i></b>
2018	<b>Best Hardware Hack, <i>Massey Hacks IV</i></b>
2016 - 2019	<b>Honour Roll, <i>Assumption College High School</i></b>