



# Yarco Hayduk, PhD

↗ <https://cv.hayduk.ch> · ↓ PDF

Researcher and systems builder working across distributed systems, blockchain infrastructure, quantitative research, and AI-native systems.

Based between Lisbon and Seoul. Citizenship: Ukraine & Canada.

- gm yarcoh
- in /in/yarcoha
- tg @yarco
- X @yarcoha

## EXPERTISE

- Distributed Systems
- Quantitative Research
- Web3 x AI
- Web3 Protocol Research
- AI Systems
- Consensus Protocols
- Blockchain Infrastructure
- Algorithmic Trading
- Technical Due Diligence
- Concurrent & Parallel Computing
- GPU & Heterogeneous Compute

## PUBLICATIONS

Research across distributed systems, concurrent computing, blockchain systems, and lock-free order book designs.

[pragma.ooo/research](https://pragma.ooo/research)

DAIS · OPODIS · ManLang · NETYS · DATE · DASFAA · DSD

## EXPERIENCE

06/2021 – Present

### General Partner

**PRAGMA VENTURES** · pragma.ooo · Lisbon / Seoul

*A private, research-first Web3 fund focused on blockchain infrastructure, tokenization, stablecoins, and AI-native systems.*

- Led technical diligence on prospective investments through deep reviews of whitepapers, protocol design, and systems architecture.
- Conducted founder interviews and technical deep dives to assess execution risk, architectural trade-offs, and the credibility of technical claims.
- Built AI-assisted research workflows to accelerate diligence and internal decision-making.
- Wrote internal research reports and diligence memos covering protocol design, technical risk, and ecosystem dynamics.
- Supported portfolio companies on systems challenges spanning indexing, parallel execution, infrastructure reliability, and on-chain data.

Selected research writing: *Monad, the Blockchain That Rewrote the EVM.*

Selected investments: TACEO OpenGradient Avalanche Quantum Redbelly Network Exo

11/2020 – 02/2021

### Principal Blockchain Architect

**COVALENT** · Vancouver, Canada

*Blockchain indexing infrastructure spanning multiple EVM networks with differing reorg and finality behavior.*

- Oversaw the design of a decentralized indexing pipeline, retrofitting a local multi-chain EVM indexing system backed by relational databases for deployment on the Moonbeam Network.
- Refined multi-chain ingestion, consistency, and query paths to preserve the reliability and performance of the centralized system across supported EVM networks.
- Contributed to strategies for handling reorgs, finality, and chain-specific indexing behavior across supported EVM networks.

Stack: Elixir Erlang Python Java SQL PostgreSQL

06/2019 – 09/2020

## Quantitative Engineer

**HEX CAPITAL** · Vancouver, Canada

*A proprietary trading firm building quantitative strategies and high-frequency trading infrastructure across crypto markets, with live multi-venue execution spanning both DeFi and CeFi.*

- Drove the design and implementation of proprietary market-neutral strategies and high-frequency trading systems across crypto venues, with a strong focus on execution quality, arbitrage capture, and execution risk management.
- Built resilient trading infrastructure spanning exchange connectivity, order routing, monitoring, and failure handling for live multi-venue deployment.
- Developed the observability stack for real-time latency profiling, execution validation, and strategy performance analysis.

Stack: [Go](#) [Python](#) [Prometheus](#) [PostgreSQL](#)

03/2019 – 06/2019

## Polyglot Developer

**BLUZELLE NETWORKS** · Vancouver, Canada

*Decentralized censorship-resistant storage network with multi-language client libraries.*

- Led implementation and support for Go, C#, and Ruby client libraries while preserving strict protocol consistency across runtimes.
- Defined and implemented cross-language client behavior with consistent semantics and predictable error handling.
- Translated asynchronous and synchronous protocol semantics into the C++ client implementation.

Stack: [Go](#) [C#](#) [Ruby](#) [C++](#)

11/2017 – 03/2019

## Principal Developer

**HQS CONSULTING** · Winnipeg, Canada

*Enterprise software and infrastructure consulting across JVM systems, cloud platforms, and production web applications.*

- Designed and built enterprise applications in Scala and Java.
- Built backend services and web platforms using Spring-based stacks, relational databases, and containerized deployment workflows for client-facing products.
- Owned deployment and operational environments on GCP, covering infrastructure administration, monitoring, release workflows, and ongoing production maintenance.

Stack: [Scala](#) [Java](#) [Spring](#) [Docker](#) [GCP](#)

10/2012 – 04/2017

## Lead Research Engineer

**PARADIME PROJECT, EU FP7** · Switzerland / Belgium / Germany

*EU-funded consortium (Neuchâtel, TU Dresden, BSC Barcelona, IMEC Belgium) targeting energy optimization across the full data center stack, with production integration work for IMEC Belgium and Cloud & Heat Technologies in Germany. This work was conducted alongside the PhD and produced most of the resulting publications.*

- Designed a distributed message-passing framework on top of Akka (Actor Model) to accelerate execution across available CPU, GPU, and distributed resources.
- Developed a compile-time code rewriting framework using Scala Macros for transparent energy-aware optimizations, requiring no application-level changes.
- Integrated agent-based coordination into existing systems at IMEC Belgium and Cloud & Heat Technologies to support seamless production operations.
- Received a **Best Paper Award** at DAIS 2016 for work on energy-efficient actor execution on heterogeneous architectures.

Stack: [Java](#) [Scala](#) [Akka](#) [C](#) [LLVM](#) [CUDA](#) [Spark](#) [ASM](#)

01/2009 – 12/2009

## Java Developer

ZILLIANT VIA SOFTSERVE · Remote

*B2B pricing optimization and revenue management software for large product catalogs, pricing workflows, and data-driven commercial decision-making.*

- Contributed to Java-based pricing optimization software used to support large-scale catalog pricing, price guidance, and margin-focused decision workflows.
- Worked on data-intensive application components involving pricing logic, statistical analysis, and high-volume product and customer datasets.
- Overhauled ORM query batching and related data-access paths to improve data-fetching throughput by **40%**.

Stack: Java Spring Hibernate REST

### EDUCATION

---

11/2017 – 07/2018

## Postdoctoral Researcher

UNIVERSITY OF BRITISH COLUMBIA · Vancouver, Canada

*Research on frequent pattern mining for Big Data streams using modern stream processing frameworks and heterogeneous CPU/GPU execution.*

**Faculty:** Faculty of Engineering

**Group:** Computer and Software Systems

**Advisor:** Prof. Alexandra (Sasha) Fedorova

**Focus:** High-throughput stream analytics, latency and throughput benchmarking, and concurrent CPU/GPU execution.

- Proposed and benchmarked streaming data-mining workflows in Spark, Flink, and Storm, with a focus on latency and throughput in real-world settings.
- Explored concurrent versions of FP-streaming algorithms designed to exploit multi-core CPUs and GPU resources for high-throughput stream analytics.
- Applied the work to social data mining and large-scale event streams, including evaluation of production-style workloads on cloud infrastructure.

Stack: Spark Flink Storm Scala CUDA

10/2012 – 07/2017

## PhD, Computer Science

UNIVERSITÉ DE NEUCHÂTEL · Neuchâtel, Switzerland

*Research spanning concurrency, energy-efficient computing, Big Data systems, GPU computing, and systems-level performance engineering.*

**Group:** Complex Systems and Big Data Lab

**Advisor:** Prof. Pascal Felber

**Thesis:** *Exploiting Concurrency and Heterogeneity for Energy-efficient Computing: An Actor-based Approach.*

- Built a heterogeneous task scheduler routing work between GPU and CPU resources based on real-time energy cost, reducing consumption by **40–80%**.
- Designed a lock-free concurrent order book for HFT workloads, compatible with LMAX Disruptor, with **15x speedup** on a 16-core machine.
- Modified OpenJDK HotSpot C++ to enable pauseless garbage collection in ParallelNew and CMS using Hardware Transactional Memory.
- Consulted on concurrency workflow design for robotic arm motion control at Innovation Mining & Incorporated Projects Inc.

**TA:** Concurrency, Security, Cloud Computing (2012–2016)

---

01/2010 – 05/2012

## MSc, Computer Science

**UNIVERSITY OF MANITOBA** · Winnipeg, Canada

Research focused on distributed data mining and uncertain-data pattern mining using MapReduce and Hadoop.

**Group:** Database and Data Mining Lab

**Advisor:** Prof. Carson Leung

**Thesis:** *Distributed frequent pattern mining algorithms for uncertain data with MapReduce.*

- Implemented frequent pattern mining algorithms for regular and uncertain data on Apache Mahout and Hadoop.
- Used MapReduce and ForkJoin on Amazon EC2 to achieve **9.5x speedup** on 11 nodes.

**TA:** Analysis of Algorithms, Automata Theory, Database Concepts

---

09/2009 – 06/2012

## MSc, Computer Science

**LIVIV POLYTECHNIC NATIONAL UNIVERSITY** · Lviv, Ukraine

Research focused on parallel frequent pattern mining for Big Data.

**Topic:** Parallel frequent pattern mining for Big Data.

---

09/2005 – 06/2009

## BSc, Computer Science

**LIVIV POLYTECHNIC NATIONAL UNIVERSITY** · Lviv, Ukraine

Studies in computer science with an early focus on concurrency middleware and systems programming.

**Topic:** Comparison of concurrency middleware in C# and Java.

**Result:** GPA 4.91/5, 2nd out of 95.

---

**Additional Training:** Engineering-focused Blockchain Bootcamp, 7 Gate Academy, Vancouver, Canada (03/2019–04/2019). Covered Bitcoin (PoW, UTXO), Ethereum (EVM, Solidity, PoS, Truffle), Zcash (zkSNARKs, Bulletproofs), 0x, Hyperledger, IPFS, and Filecoin.

### SELECTED PUBLICATIONS

---

DAIS

#### Enhanced Energy Efficiency with the Actor Model on Heterogeneous Architectures

Y. Hayduk, A. Sobe, P. Felber

**Best Paper Award**

---

NETYS

#### Exploiting Concurrency in Domain-Specific Data Structures: A Concurrent Order Book and Workload Generator for Online Trading

R. P. Barazzutti, Y. Hayduk, P. Felber, E. Rivière

---

ManLang

#### Towards an Efficient Pauseless Java GC with Selective HTM-Based Access Barriers

M. Carpen-Amarie, Y. Hayduk, P. Felber, C. Fetzer, G. Thomas, D. Dice

Full list at [dblp.org](https://dblp.org)