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# Willem Vanhulle



## EXPERIENCE

**OTIV** (Railway automation)

*Mid-level software engineer*

Ghent, Belgium

Apr. 2024 - June 2025

- **Distributed systems:** Built remote freight train control system with dynamic presence detection, custom async iterator toolkit, real-time connectivity monitoring with emergency breaking, and GStreamer/WebRTC video streaming.
- **Build systems & CI:** Integrated LSP with Bazel, led Bazel→Cargo migration, wrote CI/CD pipelines from scratch, optimized pipeline runtime by 95%. (Rust)

**Inbiose** (Biotechnology)

*Software engineer*

Ghent, Belgium

June 2021 - January 2024

- **Robotics & embedded:** Built industrial fermentation robots, interfaced with legacy hardware (25+ years) and modern sensors, migrated to async programming. (Python, Rust, C++)

## MAJOR PROFESSIONAL PROJECTS

**Emergency breaking mechanism** - OTIV

Sept. 2024 - Mar. 2025

- **Real-time monitoring:** Built heartbeat system detecting connection failures between remote operators and autonomous trains.
- **Stream processing:** Designed pub-sub/TCP stream aggregator with automatic failover and emergency breaking triggers.

## HOBBY PROJECTS

**Splitting data streams:** Designed runtime-agnostic async stream combinator using low-level primitives (Waker, Poll, Pin). Published as open-source [crate](#). (Rust)

**Probability arithmetic in Lean:** Developed library for simplifying probability calculations in formal mathematics. Extended real number arithmetic for probabilistic proofs. Available at [GitHub](#). (Lean)

## EDUCATION

**University of Utrecht** (University)

*Summer School: Formalizing Mathematics in Lean*

Utrecht, Netherlands

July 2025 - current

- **Courses:** Advanced study of theorem proving, Dependent type theory and Mathematical formalization.

**KU Leuven** (University)

*Master of Science in Pure Mathematics (Eng.)*

*Thesis: Thesis on functional programming languages*

Leuven, Belgium

Sep. 2017 - June 2019

- **Courses:** Algebra, Analysis, Discrete mathematics, Differential geometry, Unified geometry and Topology.
- **Volunteering:** Coordinator of Groot-Begijnhof Leuven student association.

## HOBBIES

**Community founder:** Founder of "Systems Programming Ghent" ([sysghent.be](http://sysghent.be)): organise networking events, in-depth talks and give workshops in Ghent about systems programming languages such as Rust and C++.