

Julian Gabriel

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Second-year Computer Science student at JKU Linz (BSc expected July 2028) and part-time C# / .NET engineer at 3 Banken IT, writing production software since 2021. Seeking a software engineering internship in 2027.

Availability: 6-9 months from early 2027, or 3 months in summer 2027.

Education

BSc Computer Science - Johannes Kepler University Linz

Oct 2025 - expected Jul 2028

- Grade average 1.74 (ECTS-weighted, 25 graded courses; Austrian scale, 1.0 best); 66 ECTS completed in the first year against a nominal 60
- Completed: Algorithms & Data Structures 1, Software Development 1-2 (Java), Operating Systems, Electronics, Digital Circuits (Logisim Evolution), Discrete Structures, Logic (formal proofs with RISCAL and Theorema), Analysis, Algebra, Databases & Information Systems 1, Multimedia Systems
- In progress, winter 2026/27: Systems Programming (C), Computability & Complexity, Algorithms & Data Structures 2, Computer Networks, Databases & Information Systems 2, Practical Introduction to Modern System Design with C++, Legal Foundations of Computer Science
- Seminar paper (2026): "Automatisiertes Refactoring im Vergleich: Manuell, IDE-gestützt und LLM-gestützt"

Apprenticeship in Application Development (Lehrabschluss) - WIFI Upper Austria

Sep 2020 - Sep 2024

- Four-year vocational software engineering programme in the Austrian dual system, completed in parallel with academic secondary school; final grade 1.0, the highest attainable

Matura (Reifeprüfung) - BG/BRG Rohrbach

2016 - Jul 2024

- GPA 1.14 (Austrian scale, 1.0 best)

Experience

Software Engineer, C# / .NET - 3 Banken IT GmbH

Mar 2026 - present

Linz, Austria. Part-time alongside full-time study.

- Migrating all 60+ Tricentis Tosca test-automation extensions from .NET Framework 4 to .NET 10 in a regulated banking codebase that 20,000+ automated test cases depend on, without disrupting active test suites; suite verified green against Tosca 2026 and the migration is being deployed to production
- Resolving breaking API changes and dependency conflicts against the live regression suite, shipping the work as reviewed pull requests through the team's CI pipeline

Software Engineer Intern - Melbourne Holocaust Museum

Jul - Aug 2026

Melbourne, Australia. Digital Collections & IT.

- Cut archival document retrieval time by roughly 90% against the previous workflow by building a Python ingestion and OCR pipeline with a full-text search index over the collection
- Generated Dublin Core and IIIF metadata for 5,000+ archival items during ingestion, and added IIIF image delivery
- Wrote the documentation and ran handover training so non-technical staff could operate the pipeline unsupervised

Junior Assistant, Digital Collections - Melbourne Holocaust Museum

Oct 2024 - Jul 2025

Melbourne, Australia. Austrian Memorial Service (Gedenkdienst): government-recognised alternative civil service abroad.

- Sole developer of an internal Vue application for the museum's roughly 50 volunteer guides, consolidating tour pathways, survivor biographies and source documents into one searchable front end: requirements, component structure, client-side routing and search, responsive phone layout, deployment
- Reworked the navigation after watching guides use it mid-tour

Software Engineer Intern - Fabasoft R&D GmbH

Jul - Sep 2024

Linz, Austria.

- Delivered a distributed queue-monitoring service in C# on an Apache Cassandra backend, giving operators live visibility across worker nodes through heartbeat tracking, job telemetry and error reporting

- Separated the service into model, data, service and performance layers using dependency injection and options-based configuration, with a unit test suite per layer

Software Engineer Intern - Fabasoft R&D GmbH

Jul 2023

Linz, Austria.

- Shipped a C# scheduling service to production with dependency injection and a unit test suite covering each scheduling path
- General C# development, testing and documentation

Software Engineer Intern - 3 Banken IT GmbH

Summers 2021, 2022

Linz, Austria.

- 2022: SQL statements, Excel data preparation, FEX statement updates, Microsoft SQL Server
- 2021: data modelling and preparation, VBA/VBS automation, requirements analysis, SQL Server data import, and a Hibernate data access layer (first exposure to Java)

Mathematics Tutor - secondary school

2022 - 2023

- Tutored secondary-school students in mathematics for one school year, in parallel with own Matura studies

Postmaster (remote, part-time) - Österreichischer Auslandsdienst

Apr 2024 - Jul 2025

- Managed onboarding for new members: provisioned Google Workspace accounts, group memberships and permissions, and sent onboarding communications

Projects

LLVM - open pull request #222351 (C++)

llvm/llvm-project#222351, Sep 2026

- Fix for issue #222281 in InstCombine, under code-owner review: relaxed the constant pre-shift fold in `commonShiftTransforms` ($C \gg (X - k) \rightarrow (C \ll k) \gg X$, and the `shl` form) so it no longer requires exact/nuw/nsw flags when known-bits analysis proves the shift amount is below the bit width, so no poison is introduced
- IR regression tests, with an Alive2 proof linked in the pull request
- Reworked the patch the same day after a reviewer pointed out that an existing transform already covered the case too conservatively - relaxing that transform instead of adding a separate `lshr` fold

TinyKV - crash-safe key-value store with REST API (Java 21) ParcivalLTD/TinyKV | live demo: kv.wavebeef.com, Aug - Sep 2026

- Bitcask-model engine: append-only log, in-memory hash index for single-lookup reads, CRC-32 per record with torn-tail detection and truncation, background compaction with `.hint` files; three durability modes (`GROUP_COMMIT`, `IMMEDIATE`, `ASYNC_OS`) with `fsync` micro-batching; 29 tests (JUnit 5, AssertJ)
- Self-measured single-machine demo figures, not a controlled benchmark: ~360 durably-synced ops/s in `GROUP_COMMIT` mode over 2,000 records; read latency p50 10.2 μ s / p95 19.1 μ s / p99 44.6 μ s; compaction reclaimed 55.7% of dead space; recovered from 9 injected corrupted tail bytes
- REST layer on `com.sun.net.httpserver` with virtual threads; multi-stage Docker image; Kubernetes manifests verified on a local kind cluster in CI

CHIP-8 Emulator - C++ / SDL2 and C#

ParcivalLTD/chip8

- Implemented the full instruction set apart from `ONNN`: a fetch/decode/execute loop over a flat 4 KB memory map, 16 registers, a call stack, hex keypad input, XOR sprite rendering with carry-register collision detection, and 60 Hz timers on a monotonic clock
- Wrote it twice as a line-for-line port, diverging only where the languages force it: GC handle pinning versus a raw framebuffer pointer, C# `volatile` versus `std::atomic` for the sound timer read from SDL's audio thread, and RAII ownership of SDL handles

Limit order book and market maker simulation - Python

ParcivalLTD/limit-order-book, Jul - Aug 2026

- Price-time-priority matching engine (price $\rightarrow$ deque per side, $O(1)$ FIFO per level; lazy-deletion price heap, $O(\log L)$ amortised) with a market maker and three other agent types; latent value is a random walk with jumps, seen directly only by informed traders
- P&L decomposed as `total = edge + position` and asserted as an identity on every seed; 38 pytest tests (~8 s) and an experiment runner that blocks on test failure

- Findings over 20 seeds $\times$ 8,000 steps (simulation, not market results): a 0.2 inventory skew cut the standard deviation of the market maker's P&L about sixfold while raising its mean; P&L peaked at a 5-tick half-spread, while 1-tick quoting maximised volume but lost the most; edge per contract turned negative as the informed-trader arrival rate rose towards 0.9

Materials ML Hackathon - ÖAW / Montanuniversität Leoben

ParcivalLTD/materials-ml-hackathon, May 2026

- Team entry: 1st place in two of the four tracks (martensite start temperature, polymer glass transition temperature) and 3rd place overall
- Martensite start temperature: beat the published empirical baseline (Andrews 1965: R^2 0.741, MAE 35.2 K) with R^2 0.941 and MAE 18.1 K, by stacking seven base models with 10-fold out-of-fold predictions under a Ridge meta-learner, fixed seed 42
- Polymer glass transition temperature: 5-fold cross-validated R^2 0.882 ± 0.013
- Engineered 60+ features in Python (scikit-learn, LightGBM, XGBoost, pandas, pymatgen), feeding the outputs of published empirical formulas (Andrews, Schaeffler, stacking-fault energy) in as model inputs rather than discarding them as baselines
- Other tracks: nanoindentation phase classification macro-F1 0.842 against a 0.206 majority baseline; Vickers hardness RMSE 7.28 HV / R^2 0.502 against a 10.3 HV mean baseline

ESP32 / ESPHome Bluetooth Low Energy proxy - self-hosted home automation

- Runs an ESP32 with ESPHome as a Bluetooth Low Energy proxy, bridging 5+ BLE devices on the home network into a self-hosted Home Assistant instance
- Hosted Home Assistant on an Oracle Cloud Ubuntu server rather than a local Raspberry Pi for the compute headroom, with the ESP32 providing the radio link the remote host otherwise lacks

Skills

Languages Java (through Java 21), C#, Python, C++, SQL, TypeScript, JavaScript

Systems & low-level LLVM IR, instruction-set emulation, memory maps, timing loops, SDL2, digital logic (Logisim Evolution), ESP32, ESPHome, Bluetooth Low Energy

Backend & data .NET (Framework 4 - 10), Apache Cassandra, Microsoft SQL Server, Hibernate, REST APIs

Machine learning scikit-learn, LightGBM, XGBoost, pandas, NumPy, pymatgen, Jupyter

Web Vue, Nuxt, Node.js, Tailwind CSS

Tools & infrastructure Git, GitHub Actions CI, Docker, Linux (daily driver), Kubernetes, Gradle, JUnit 5, AssertJ, pytest, Tricentis Tosca

Awards and Honours

Österreichische Studienstiftung - Austrian Academy of Sciences (ÖAW)

2026 - present

- Competitively awarded; research mentorship under Prof. Richard Küng (JKU Linz) in quantum information and machine learning

3rd place - Dr. Hans Riegel Fachpreise, Computer Science, Upper Austria

2024

- For the written report "Emulation of Video Games: Functionality and Applications", built on the CHIP-8 emulator above

Additional

Languages German (native), English C1 (Cambridge Certificate in Advanced English), Spanish B2

Certifications ECDL Standard Certificate, driving licence B

Interests Acrobatics - member of the international showteam "The Freaks", performing across several countries; strength training and running; cooking