

# Luke Naylor

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## Experience

- Oct 2025 –ongoing **Research Software Engineer, Huawei R&D UK**, Edinburgh, Contract  
R&D around the Cangjie<sup>1</sup> Programming language:
- Research and develop “*effect handler*”-based algorithms for **industry applications**
  - Promote the usage of the “*effect handlers*” language feature through blog posts
  - Library ecosystem development
  - Develop and improve containerised build system
  - Technologies used: **C++23, Cangjie, Docker**.
- 2020–2024 **University Tutor, School of Maths and Usher Institute**, University of Edinburgh  
Part-time approx. 600hrs **alongside PhD**.
- **Accredited** “Associate fellowship of the higher education academy”.
  - Tutored in courses teaching **Git, R, Python, pandas, and NumPy/SciPy**.
  - Built **Docker containers** for the student development environment and integrated with GitHub **Codespaces** as part of an **accessibility** project for course.
  - Involved with **auto-grading** system for course, **reducing workload** for markers.
  - Created **teaching material** related to using **debuggers**.
  - Ran course promoting tech literacy to mathematics graduates.
- 2019–2020 **Systems Software Engineer, Micro Focus**, Newbury, 1 year  
Permanent position in ‘core-tech’ team working on **COBOL** compiler.
- Refactored **test coverage** utility to produce web report fitting company branding.
  - Updated and **document** internal **API changes**.
  - **Communicated** with pre-sales team to clarify details in **compiler behaviour**.
  - **Improved CI** to ensure product **compatibility** with all **customer C** compilers.
  - Technologies used: **SVN, COBOL, C, C++, awk, sed, batch, ksh**.
- Jul–Aug 2017 **Summer Student, Perm State University**, Russia  
2 month summer course in computational fluid dynamics.
- Finite difference methods for PDEs, implemented in **Fortran**.
  - Parallelization with **OpenMP** and **MPI**.
  - Industry and academic software (**Ansys** and **OpenFOAM**).
- Summers 2018/9 **Residential Advisor, Hertford College**, Oxford  
Day to day helper for international summer school students.

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## Software Projects

- zed-latex<sup>9</sup> **LaTeX extension for the Zed editor**  
**Main contributor** on extension with over **180k downloads**. **Rust** compiled to **WASM**.
- TeXpresso-LSP<sup>8</sup> **Language server for live LaTeX rendering**  
Wraps around existing experimental preview as you type project “TeXpresso” to allow **LSP**-enabled editors to use the technology. Involving changes to **C** codebase, along with **TypeScript** language server. Complemented with Zed extension<sup>7</sup>.
- TeXpresso fork<sup>6</sup> **Modern C++ rewrite project**  
Personal educational fork of a **C** codebase which the above language server wraps around. **Incremental** rewrites of specific files to **modern C++** for a real world feel of using the newer standards (up to C++23).

- tilt-rs<sup>2</sup> **Rust crate to expose computation from PhD thesis**  
 Computation library and executable central to PhD thesis, multiple orders of magnitude faster than pre-existing implementation.
- tilt.leptos<sup>4</sup> **WASM WebApp to expose part of PhD**  
 Fine-grained reactive **WebApp** powered by the Rust crate above using **Leptos**.
- pseudowalls<sup>5</sup> **Python/SageMath library related to PhD**  
 Symbolic computations library related to the pure mathematics in my PhD thesis.

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## Education

### University

- 2020–2025 **PhD in Mathematics**, *University of Edinburgh, Minor corrections*  
 Title: “*Criterion for the accumulation of  $\nu$ -walls*”<sup>3</sup>, supervised by Prof. Antony Maciocia, in the area of algebraic geometry.
  - Optimised performance on **computational problem** by multiple **orders of magnitude**.
  - Theoretical **research** results about walls of **Bridgeland stability** conditions on surfaces.
  - Thesis includes content **automatically generated** by computer algebra, with the associated **Jupyter notebooks** seamlessly included in the appendix.
  - Explored **Lean3/4** for **theorem proving**. Involved in project testing the feasibility for a Lean4 game teaching students topology.
- 2018–2019 **Masters in Mathematics**, *University of Oxford, First Class*
- 2015–2018 **Bachelors in Mathematics**, *University of Oxford, First Class*  
 Specializing mostly around algebra, analysis, geometry and topology.
  - Nathan Prize for yr 3 results (from University College)
  - **Scholar** year 3 onwards (Exhibitioner year 2)
  - Maths week prize (from University College introduction week)

### High School

- A-levels Mathematics (A\*), Further Mathematics (A\*), Physics (A), Computing (A)
- School The Cherwell School Academy
- Achievements
  - Distinction in British Maths Olympiad (BMO) round 1
  - Silver Crest Award (for H<sub>2</sub>O molecule computer simulation)
  - Grade 1 in STEP I and II
  - Copper Award in Cambridge Chemistry Challenge
  - Bronze Award in International Chemistry Olympiad
- Computing Coursework Built website for a small business ([www.clockworkmusic.com](http://www.clockworkmusic.com)). This involved **HTML, LESS/CSS, Coffeescript, PHP, MySQL**, and the **Google Maps API**.

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## Links

- [1] *Cangjie Programming Language*. <https://cangjie-lang.cn/en>.
- [2] *Computing pseudowalls (Rust crate)*. <https://gitlab.com/pseudowalls/tilt.rs>.
- [3] *Criterion for the accumulation of  $\nu$ -walls (PhD thesis)*. <https://era.ed.ac.uk/handle/1842/43553>.
- [4] *Pseudo-wall finder (WebApp)*. <https://lukideangeometry.xyz/pseudowalls>.
- [5] *pseudowalls (Python lib)*. <https://gitlab.com/pseudowalls/pseudowalls>.
- [6] *TeXpresso fork*. <https://github.com/lnay/teXpresso>.
- [7] *TeXpresso Zed extension*. <https://zed.dev/extensions?query=teXpresso&filter=language-servers>.
- [8] *TeXpresso-LSP*. <https://www.npmjs.com/package/teXpresso-lsp>.
- [9] *zed-latex*. <https://zed.dev/extensions?query=LaTeX&filter=language-servers>.