Stuart Ballantyne

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Education

University of St Andrews, BSc (Hons) in Physics — 2018 – Present

- Year four (final)
- Expected graduation June 2022
- Modules include: object-oriented programming (using Java), multivariate and vector calculus, linear algebra, mathematical modelling, electronics, computational physics, signal processing, data mining, transferable skills

Bathgate Academy — 2012 – 2018

- **Advanced Highers:** Mathematics, Computer Science, and Physics
- **Highers:** Mathematics, Computer Science, Physics, Chemistry, and English

Experience

Canon Medical Research Europe, Software Engineering Intern — June – Aug 2021

Working in an Agile enviornment, I prototyped a client-side (web browser based) 2D medical image renderer, comparing performance renderers using SDL and WebAssembly, GPU.js, and Cornerstone.js. Learned TypeScript and gained a better understanding of JavaScript. Results were presented to the rest of the company at the end of the internship.

Skills

- **Programming languages**: C++ (most experience), Python, TypeScript, JavaScript, Lua, Mathematica, Java
- Knowledge of Git, CMake, Meson, WASM, Node.js, and experience using Windows and Linux for development

Projects

Two-week physics group project: modelling trajectory of golf balls

- Led a team of five to model the flight path of a golf ball as part of first-year physics coursework
- Quickly learned Python and the NumPy API so I could develop the model
- Model considered effects such as drag, lift, spin, and effect of dimples on the ball trajectory
- Helped format the 2000-word report using LaTeX; wrote about the underlying physics and the approximations used

Chess engine

- Created a C++17 chess engine as a pet project
- Learned about multithreading, game tree search algorithms, and how to optimise C++ code

Other

- Active member of the St Andrews chess society
- Volunteered and helped 2nd-year Computing Science students during high school