

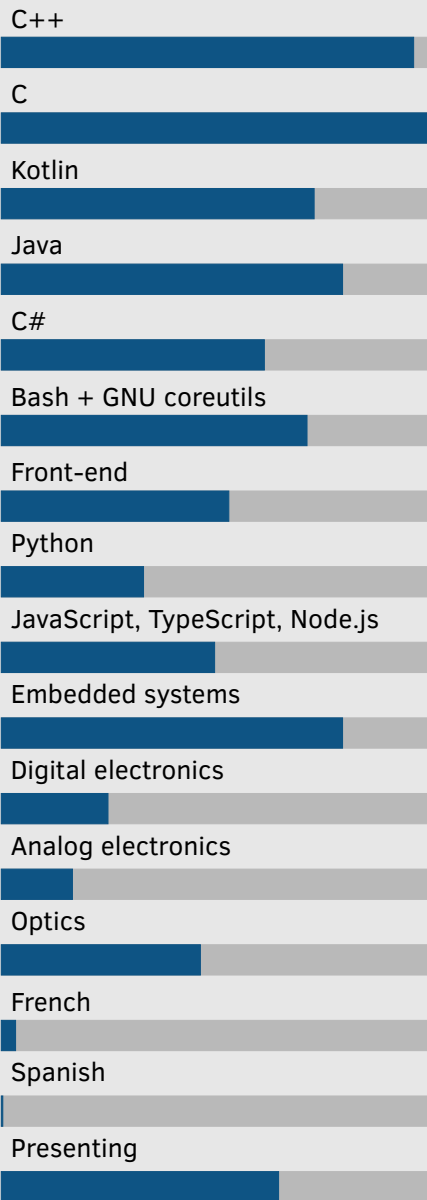


Mark K Cowan

Software Engineer

- Tallinn, Estonia
- hackology.co.uk
- mark@battlesnake.co.uk
- github.com/battlesnake
- linkedin.com/in/photonicist

Skills



Experience

- 2018–2018** Lead flight software engineer Open Cosmos
Designing the next-generation flight software (C/Kotlin), to be flown on hundreds of mass-produced spacecraft.
Training others in the design and in associated computer-science and operating-systems theory, so that they can implement it and maintain it.
- 2017–2018** Head of software Open Cosmos
Building and growing a team of skilled software engineers, aerospace engineers & physicists.
Headhunting, approaching, interviewing, testing — the whole lot.
Managing resource-allocation and acquisition across projects.
Training/teaching the team:
 - ▶ Algorithms & data-structures
 - ▶ Operating systems (schedulers, filesystems, networking, ...)
 - ▶ Concurrency (distributed/parallel/asynchronous styles)
 - ▶ Object-orientated design patterns (gang-of-four)
 - ▶ Functional programming basics (for SQL, redux, lodash, ...)
 - ▶ POSIX/Linux
 - ▶ Gitlab/DevOps
 - ▶ Real-time (latency-constrained) programming
 - ▶ Optimisation (data-structures, dynamic programming, ...)Helping the infrastructure/ops team to replace my original “startup-grade” infrastructure with a robust and resilient micro-service architecture, using tools including:
 - ▶ Kubernetes
 - ▶ RabbitMQ
 - ▶ RedisDeveloping:
 - ▶ A lightweight (low-RAM) flash filesystem
 - ▶ Java/Swing application for managing satellite dev. kits
 - ▶ Devicetree for our own in-house designed Linux boards
- 2015–2016** Software & payload engineer Open Cosmos
Developing:
 - ▶ Flight software (C / FreeRTOS / AVR32)
 - ▶ Mission-control software (C)
 - ▶ Radio control software (C++ / SDR)
 - ▶ Radio modulator/demodulator DSP software (C)
 - ▶ Cloud infrastructure (Docker / DigitalOcean)
 - ▶ Machine-to-machine communications (ZeroMQ)
 - ▶ Web app (AngularJS / TypeScript / Node.js / PostgreSQL)
 - ▶ Mission simulator (Java / Maven / Gradle)
 - ▶ Development kits (Das U-boot / Linux / systemd / coreutils)
 - ▶ Test electronics (Kicad)
- 2015–2015** Entrepreneur in residence Entrepreneur First
Invited onto Entrepreneur First cohort #5, from where I saw the start of Open Cosmos, which I joined a few months later.
- 2014–2015** Front-end developer Eesti Rahvusringhääling
Development and maintenance of widgets such as the homepage schedule browser and the live-stream viewer.
Using HTML5, CSS3, JS, C#, .NET MVC4.
- 2012–2013** Entrepreneur *Various freelance jobs and short-lived startups*
- 2012–2012** Lab demonstrator University of Manchester
Teaching and supervising laboratory projects for BSc students, involving real-time tomographic imaging of mixing processes.
- 2006–2011** Head coach / coach / assistant coach *Various squash clubs*

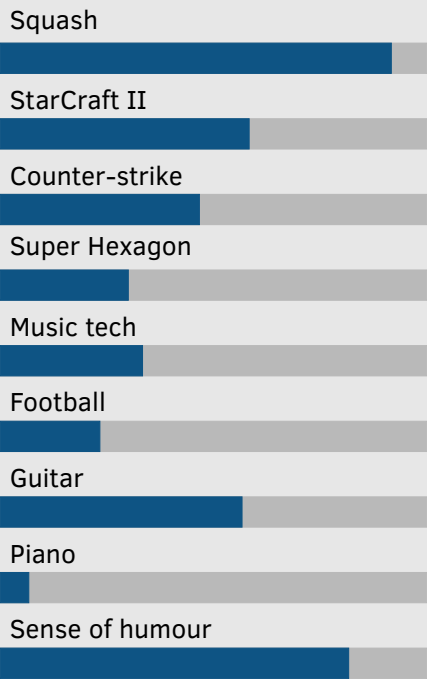


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More skills



Education

- 2013–2013 Machine Learning Coursera
Andrew Ng's course on Coursera, 100% score.
- 2011–2013 PhD Chem. Eng. & Analytical Sci. University of Manchester
I taught a lab project involving real-time tomographic imaging of mixing processes. I left the PhD during 2nd year, as rate of progress was too slow for my liking.
I took several extra taught courses including:
 - ▶ COMSOL Multiphysics
 - ▶ NMR spectroscopy
 - ▶ OpenCL
 - ▶ OpenACC
 - ▶ OpenMP
 - ▶ MPI
 - ▶ Intel Parallel Studio XE
- 2010–2011 MSc Photon Science University of Manchester
Distinction in:
 - ▶ Holography and imaging
 - ▶ Optical instruments
 - ▶ Soft-matter physics
Merit in:
 - ▶ Semiconductor quantum structures,
 - ▶ Laser technology
 - ▶ Laser photomedicine
 - ▶ Lasers and photonics
 - ▶ Soft-matter physics
I was elected as representative for the course.
I was elected as treasurer for the post-graduate society.
- 2007–2010 BSc (Honours) Maths and Physics University of Leeds
First class in:
 - ▶ Advanced quantum mechanics
 - ▶ Medical imaging
 - ▶ Calculus and mathematical analysis
 - ▶ Modelling with differential equations
 - ▶ Intro to music technology
Upper second-class includes (non-exhaustive):
 - ▶ Nuclear physics & energy
 - ▶ Advanced mathematical methods
 - ▶ Further linear algebra
 - ▶ Project (distributed computer simulation)
I represented the university nationally at:
 - ▶ Squash
 - ▶ Shodokan Aikido
 - ▶ Korfbal
 - ▶ Tenpin bowling
- 2000–2007 High school / Sixth form Lancaster Royal Grammar School
Advanced (A) level in:
 - ▶ Maths
 - ▶ Further Maths
 - ▶ Physics
 - ▶ Chemistry
 - ▶ Critical thinking
Various awards including:
 - ▶ Community Sports Leadership award
 - ▶ "Distinction" in British Informatics Olympiad
 - ▶ Consistent "Gold" awards in Mathematics Olympiad

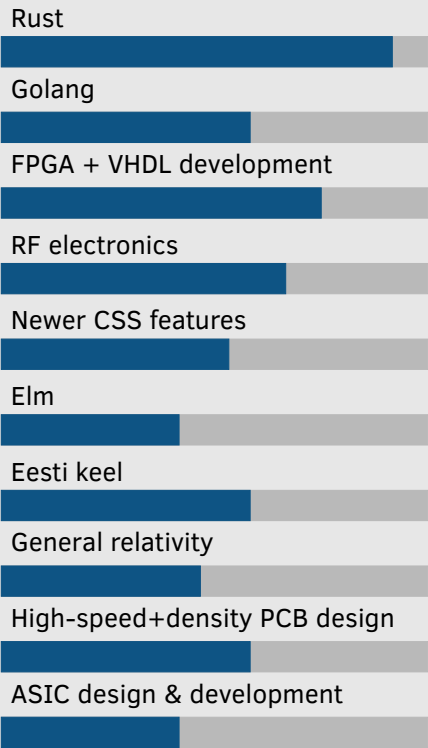


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Want to learn —



Miscellaneous

- **References** LinkedIn
References are immediately available on myLinkedIn profile at <https://www.linkedin.com/in/photonicist/>.
See the “Recommendations” section on the profile.
- **Patent** GB201603920A
Apparatus and method for satellite payload development.
- 2016 **Hackathon** ActInSpace @ Tallinn
Won fast-track to Prototron accelerator with lunar agriculture concept.
- 2018 **“Boom” generative graphics/audio project** JS+GLSL+Povray
A HTML5 canvas + WebGL + GLSL + WebAudio project, to experiment with procedural generation.
There’s no real objective or meaning in this artwork, it’s just for fun.
It’ll never be finished, I’m always adding layers and sections to it when I get inspiration.
- 2013 **“neural”** CTAN/LaTeX
A LaTeX package for drawing neural-network diagrams with Tikz.
100+★ on Github.
- 2015 **“angular-chrome”** Chrome/JS
A Chrome extension for inspecting AngularJS contexts.
Available on the Chrome Store, but the URL is huge.If your PDF viewer supports hyperlinks then you can just click here to open it.
It has ten reviews averaging slightly over 4.3/5★ at the time of writing this.
On Github at github.com/battlesnake/angular-chrome.
- 2015 **“gulp-google-webfonts”** npm/node.js
A node.js/gulp package for automatically downloading fonts from Google WebFonts during the build process, and auto-generating the relevant CSS.
Consistently >1000 weekly downloads from npm at npmjs.com/package/gulp-google-webfonts.
50+★ on Github at github.com/battlesnake/gulp-google-webfonts.
Used by BitWarden project among others.
- 2015 **“kaiu”** C++
A collection of interacting asynchronous and concurrent experiments in C++.
Not used in production, nor should it as the heavy templated nature of this library means that compile times will explode massively.
On Github at github.com/battlesnake/kaiu.