

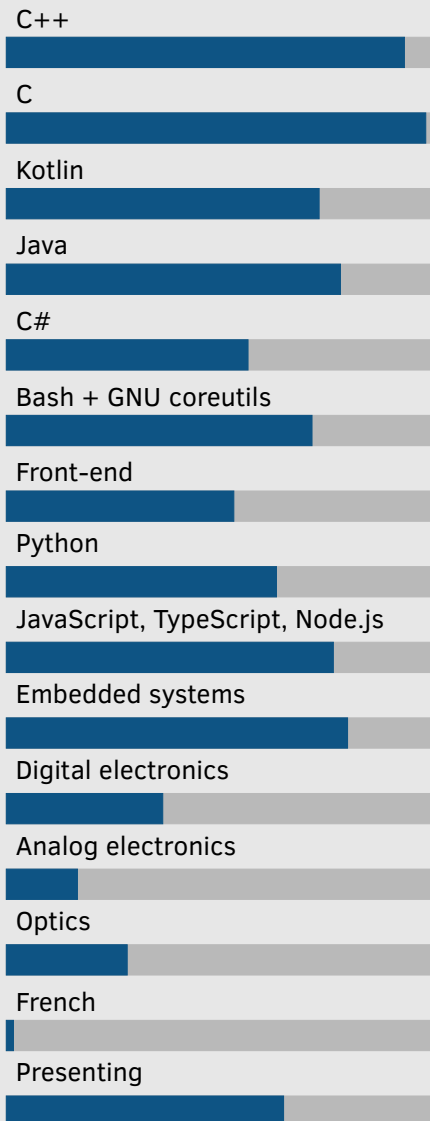


Mark K Cowan

Software Engineer

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

Skills



Experience

- 2019–** Senior Data Engineer Bolt
 Building automation for huge machine-learning pipelines
 Automating container building, data extraction, model training, testing, and deployment; building pipelines which produce 100+ models, with high parallelism.
 Objectives: make re-training faster (from a week to a few hours), fault-tolerant, significantly cheaper, and user-friendly so that data-scientists can own their pipelines in production.
 Tools: AWS (EC2, S3, Sagemaker, Redshift, ...), Airflow, Python, Docker, Jenkins, Bash, TypeScript.
- 2018–2019** 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, and optimisation
 - ▶ Operating systems (schedulers, filesystems, networking, ...)
 - ▶ Concurrency (distributed/parallel/asynchronous styles)
 - ▶ Linux / POSIX
 - ▶ Real-time (latency-constrained) programming
 Developing:
 - ▶ A lightweight (low-RAM) flash filesystem
 - ▶ Java/Swing application for managing satellite dev. kits
 - ▶ Devicetrees for our own in-house Linux boards
- 2015–2016** Software & payload engineer Open Cosmos
 Developing:
 - ▶ Flight software (C / FreeRTOS / AVR32)
 - ▶ Mission-control software (C / Node.js)
 - ▶ Radio control software (C++ / SDR)
 - ▶ Radio modulator/demodulator DSP software (C)
 - ▶ Cloud infrastructure (Docker)
 - ▶ Machine-to-machine communications (ZeroMQ)
 - ▶ Web app (AngularJS / TypeScript / Node.js / PostgreSQL)
 - ▶ Orbital mission simulator and designer (Java / Gradle)
 - ▶ Development kits (Das U-boot / Linux / systemd / Kicad)
- 2015–2015** Thundercloud Tech
 Short-lived startup while on Entrepreneur First.
 Improving the UK power grid's low-voltage network's efficiency and reliability.
- 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
 The usual culprits: HTML5, CSS3, JavaScript. Also C#, .NET MVC4, Entity Framework, MS SQL.
- 2012–2012** Lab demonstrator University of Manchester
 Teaching and supervising laboratory projects for BSc Chemical Engineering 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

Squash

StarCraft II

Counter-strike

Super Hexagon

Music tech





Ice-skating

Guitar

Piano

Sense of humour

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 several Mathematics Olympiads

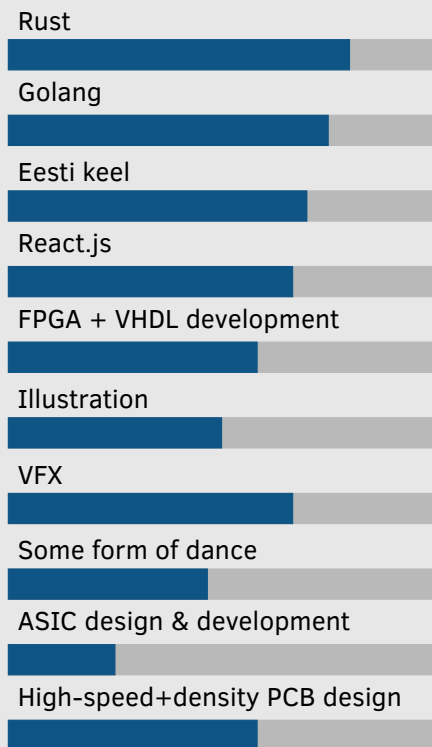


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Want to learn



Miscellaneous

- **References** LinkedIn
References are immediately available on my LinkedIn 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.
Live at <https://hackology.co.uk/boom/>.
Due to WebGL+WebAudio usage, this will not work on most smartphones/tablets. It should work on any half-decent PC running Chrome or Firefox.
- 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++
Self-learning project: 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.