

David King Gu Ma

Nationality: Australian
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PROFILE

Bioinformatics Software Engineer.

Specialising in Data Visualisation, User Experience and Community Building.

I enjoy solving problems and making people's lives better.

EXPERIENCE

- **Bioinformatics Systems Developer** (2024 - current) — In this role, I have driven the implementation of robust research data management solutions, including the migration of petabytes of genomic data to scalable cloud infrastructure (AWS S3 and VAST). Collaborating across multidisciplinary teams, I enhanced AGRF's genetic sequencing infrastructure integrating new bioinformatics workflows and ensuring compliance with regulatory standards. I established best practices in coding and deployment, reducing system downtime, and led training initiatives to build team capacity in continuous integration and data governance. These efforts have ensured data reliability, optimised workflows, and supported AGRF's mission to deliver high-quality genomic services.
- **Web Design Studio Instructor** (2023 - 2024) — Taught the Web Design (CDS2704) course for the Monash University school of Art, Design and Architecture. I taught 2 classes of 20 MADA students how to create websites. From design critique, to low fidelity paper prototyping, to high fidelity figma designs and finally implementation using Webflow.
- **Frontend Software Engineer** (2020 - 2022) — Bioinformatics Methods Team under Dr Simon Sadedin. A new team at the Murdoch Children's Research Institute (MCRI) which aims to provide advanced, user friendly bioinformatics tools to remove the bottleneck found in the traditional "service bioinformatics" model and give all researchers at the MCRI access to cutting edge genetics technology in a scaleable, sustainable and maintainable way.
- **Bioinformatics Software Engineer** (2015 - 2020) — Worked in Dr Ken Doig's team on the PathOS project at the Peter MacCallum Cancer Centre, an application for curating genetic variants found during high throughput sequencing of cancer patient samples. I oversaw the frontend development, user experience and developer operations.
- **Bioinformatics Software Developer** (2013 - 2015) — Worked for Professor Sean O'Donoghue at the Garvan Institute on the Minardo project (<https://minardo.david-ma.net/>), a continuation of my undergraduate thesis (see below). I worked with a graphic designer and biologist to produce a Cell Snapshot (see publications), a webpage diagram of the Insulin Signaling Pathway using D3.js to tie data to an SVG prepared in Adobe Illustrator by the graphic designer.
- **Bioinformatics Undergraduate Thesis** (2013) — At the University of New South Wales (UNSW), designing and implementing a bespoke user interface for the purpose of displaying time series mass spectrometry data projected onto the insulin signaling pathway, targeting the specific needs of researchers in the Garvan Institute of Medical Research, with the long term goal of generalisability to other datasets and research needs. (<https://minardo.david-ma.net/>)
- **Science Internship** (2013) — With the O'Donoghue Lab at the Commonwealth Scientific and Industrial Research Organisation (CSIRO) on the Aquaria project (<https://aquaria.ws/>) under Dr. Sean O'Donoghue. Worked in web development, design and data visualisation.

COMPUTER LANGUAGES & TECHNICAL SKILLS

Data Management, Digital Archives, Community management and leadership, HTML, Javascript, CSS, Typescript, SCSS, Node.js, Python, R, Bash, MySQL, PostgreSQL, D3.js, JQuery, Agile Development, Design Thinking, Rapid Prototyping, User Experience, JIRA, Confluence, AWS S3, AWS Cloudformation, AWS InfiniDASH, Finops, Devops, Groovy, Grails, DataTables, React, Vue, Webflow, Docker, Kubernetes, Slurm, HPC management

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PUBLICATIONS

[PathOS: a decision support system for reporting high throughput sequencing of cancers in clinical diagnostic laboratories](#) — Publication detailing the Peter MacCallum Cancer Centre's NGS clinical reporting system.

Doig KD, Fellowes A, Bell AH, Seleznev A, Ma D, Ellul J, Li J, Doyle MA, Thompson ER, Kumar A, Lara L, Vedururu R, Reid G, Conway T, Papenfuss AT, Fox SB. PathOS: a decision support system for reporting high throughput sequencing of cancers in clinical diagnostic laboratories. *Genome Med.* 2017 Apr 24;9(1):38.

[SnapShot: Insulin/IGF1 Signaling](#) — An interactive visualisation of the insulin signaling pathway.

Ma, David KG, Christian Stolte, James R. Krycer, David E. James, and Seán I. O'Donoghue. "SnapShot: Insulin/IGF1 Signaling." *Cell* 161, no. 4 (2015): 948-948.

[Visual Analytics of Signalling Pathways Using Time Profiles](#) — A textbook chapter on the application of visual design techniques to better present data, specifically time series proteomics data. DKG Ma, C Stolte, S Kaur, M Bain, and SI O'Donoghue. In Sun C, T Bednarz, TD Pham, P Vallotton, D Wang, eds. *Signal and Image Analysis for Biomedical and Life Sciences*. Switzerland: Springer, 2014;3-22.

[Visual analytics of the insulin signalling pathway using phosphorylation time profiles](#) —

Conference proceedings, detailing a new solution to visualising high dimension network graphs. DKG Ma, C Stolte, S Kaur, M Bain, and SI O'Donoghue. In *Proceedings of the 2013 International Symposium on Computational Models for Life Sciences (CMLS-13)*, Sydney, Australia. AIP Conference Proceedings 1559, 185-96.

AWARDS

The Minardo project was part of Biocode, a finalist entry for the **[2015 Eureka Prize for Excellence in Interdisciplinary Scientific Research](#)**.

[Minardo: Untangling the Hairball](#) won the Nature Methods poster prize at VIZBI 2016.

EDUCATION

Trinity Grammar School — International Baccalaureate

University of New South Wales, Sydney, NSW — Bachelor of Engineering (Bioinformatics)

VOLUNTEERING

- **Lead Organiser** (2016) — Ran HealthHack Australia for *Open Knowledge Australia*. I was responsible for the Melbourne location, national website and national technical operations. HealthHack Australia is a 48 hour hackathon which brings together more than 300 participants in 5 cities, with representatives from dozens of hospitals, research institutes, government departments and tech companies, to tackle real problems presented by healthcare professionals for hackers to solve.
- **Dean of the Awesome Foundation** — Leads the Melbourne chapter of a global microphilanthropy network (<https://www.awesomefoundation.org/en/chapters/melbourne>). We give out \$1000 grants every month to charitable causes. As Dean I recruit members and keep them attending and donating. I delegate tasks to our members and I maintain a steady flow of grant applications for us to review.

REFERENCES

Contact details available on request

Dr. Xavier Ho (Lecturer, Department of Design, Monash University)

Dr. Simon Sadedin (Head of Clinical Bioinformatics, Murdoch Children's Research Institute)

Dr. Ken Doig (Data Architect & Bioinformatician, Peter MacCallum Cancer Centre)