

Adam Kewley, Ph.D.

<http://adamkewley.com>

I am a research software engineer who has written software, both as a hobbyist and as a professional. My academic background is in materials chemistry research. I want to produce solutions that join science and software together. To that end, I have developed software that helps chemists automate their research, allows industrial researchers to standardize their workflows, and enables astronomers to work with petabytes of data.

Experience

- I am experienced in research software engineering. My current project, Gaia, involves engineering production-quality platforms which enable astronomers to query and run algorithms on multi-petabyte datasets. This requires a strong foundation in software engineering and regular collaboration with research astronomers.
- I am an experienced software engineer. I have been writing software since early high-school. I have developed applications in functional, object-oriented, and procedural styles. I have also worked in teams that practise production development techniques; for example, automated testing, continuous integration, and pair programming.
- I am a published research chemist. My Ph.D. focused on using robotic platforms in synthetic materials chemistry, similar to the more advanced systems being built in the new Materials Innovation Factory (MIF). This also involved developing new analytical techniques and engineering software pipelines to aggregate and visualize the data produced by those techniques. My published works involved collaboration with computational chemists and overseas research scientists to corroborate my analyses.
- I have industrial experience in research systems and data science. My role in Unilever involved the development of software and data science platforms that helped research chemists conduct their research faster, more repeatably, and more transparently. I developed data extraction and visualization systems for Unilever's chemists, which enabled them to understand trends in their data much more quickly. It also made sharing the data between teams easier, which helped with collaboration and monitoring.
- My experience in software engineering and design goes beyond my formal career history. In order to self-teach software engineering, I have consistently challenged myself with software and design projects. A handful of these ideas are published on my GitHub account. Some of my more artistic designs have been published as journal covers (see website for examples). My most well-worn books are "The Pragmatic Programmer" and "Code Complete" – this reflects my interest in engineering reliable software platforms that are easy to maintain and extend.
- I enjoy sharing my experiences with the wider community. During my Ph.D., I actively engaged in outreach activities such as RSC's "spectroscopy in a suitcase" and summer classes. In my current role, I have participated in events such as the "big bang" convention (Birmingham 2017), where I demonstrated the virtues of being a software engineer in astronomy to interested members of the public.

Career History

Nov 2016 to Present	Gaia Software Developer	University of Cambridge
<p>I engineer systems that work on Gaia's multi-petabyte datasets. At a high-level, my work involves developing servers, job schedulers, and cluster jobs on top of HPC services. At a low-level, I develop a suite of algorithms in Java, with ruby being used for scripting/automation and ANTLR4 being used to generate parsers for the DSLs used in the stack.</p> <p>The European Space Agency (ESA) ensures that all software written meets a high software engineering standard. As a result, my work has a high degree of unit test coverage and undergoes continuous integration and peer review. I was attracted to this project because of its tough distributed computing challenges, freedom to design solutions, and ESA's commitment to open-source.</p>		
Nov 2015 to Nov 2016	Automation, Data, and Standardisation Scientist	Unilever PLC
<p>At Unilever, I produced software solutions that helped automate, standardize, centralize, and visualize researchers' data. Unilever conducts a large volume of research across many research sites, which makes standardization and centralization of their data <i>particularly</i> valuable.</p> <p>The role involved developing C# WPF UI applications, C# HTTP clients, dashboards in Tableau, data aggregation pipelines in a variety of scripting languages, writing user-facing documentation, and writing software specifications for 3rd-party specialists and researchers.</p>		
Feb 2015 to Nov 2015	Full-Stack Web Developer	Crown Informatics Ltd.
<p>At Crown, I developed clinical audit platforms that were deployed to NHS hospitals nationwide. I designed and developed Crown's landing page, user-facing login portals, contact system, and an analytics system that let end-users visually interact with Crown's data. This role mostly involved software engineering in javascript, ruby, and IBM domino. It also required me to design user experiences that suited Crown's widely varied userbase.</p>		
Mar 2011 to Feb 2015	Ph.D. in Chemistry	University of Liverpool
<p>My Ph.D. focused on two areas: the high-throughput synthesis of porous organic cages and the analysis of organic cages' adsorption behavior. Practically speaking, the post involved programming synthetic chemistry robots and designing analytical experiments. That work was accelerated by developing applications and algorithms that solved any practical/processing problems that popped up throughout the project. Overall, the project produced a new cage molecule, several interesting discoveries about adsorption behavior in cages, practical separation technologies, and a number of publications.</p>		
Dec 2010 to Feb 2011	VBA Software Developer	Henkan Ltd.
<p>Henkan is a consultancy that specializes in industrial manufacturing. This was a short-term placement in which I developed excel-based applications that calculated the efficiency of various industrial workflows.</p>		
Summer of 2008	Nuffield Research Placement: Inorganic Chemistry Research	University of Nottingham
Summer of 2007	Pharmacy Order Picker	Wirral NHS Trust
Summer of 2006	Nuffield Work Placement: Civil Engineering	Mouchel PLC