Fred Cook

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I have been programming for eight years, having initially learned to program in C before largely switching to Python 3 in 2016. The skill set I have developed in this time has proved invaluable, allowing me to approach and solve a wide variety of problems.

Education

PhD Physics *University of Bristol*   `2016-2021`

Title: *Development of Apparatus for Ice Nucleation Studies.*

The fundamentals of what makes a good ice nucleator remain poorly understood at the nanoscale. In my PhD I developed three experimental methods:

- A novel way of automating a standard experimental technique ([published](#))
- An updated version of an automated lag time apparatus ([ALTA](#)) for ice nucleation studies
- An environmental chamber for freezing acoustically levitated water droplets.

Some relevant highlights of my PhD work include:

- A program for detecting freezing droplets from a series of images, including tracking the movement of the droplets, written in Python using OpenCV.
- Reverse engineering the instruction set for a picolitre droplet printer, allowing a custom labVIEW program integrated with an X-Y translation stage to be written.
- Python scripts for cleaning, analysing, simulating and graphing data using standard scientific libraries (NumPy, SciPy and Matplotlib)
- Programmed microcontrollers (Arduino and pyBoard) to read peripherals and control experiments.

MSci Physics *University of Bristol*   `2012-2016`

First class honours

A-levels *Alleyns School*   `2005-2012`

Physics A*****, Maths A*****, Economics A (AS-level politics A)

Software Development Skills

Python 3	Five years of experience. Well versed in core scientific libraries (**Numpy**, **Scipy**, **Matplotlib**). Personal projects include web-scraping scripts, a [tool for creating themed crosswords](#) and a [device for monitoring and controlling the pH of soil](#).
Misc.	Experience programming in C/C++, as well as HTML/CSS, LabVIEW and clojure at a beginner level. I have been using git for several years.

Publications

Cook et al., *[A pyroelectric thermal sensor for automated ice nucleation detection.](#)* (2020) Atmos. Meas. Tech. Disc. 13, 2785–2795

Cook et al., *An updated automated lag-time apparatus for ice nucleation studies.* Awaiting submission.