

# Joe MacMahon

## About Me

**Summary** Analytical thinker, creative hacker and occasional student; I am enthusiastic about technology and its place in the world.

I'm studying Computer Science and Maths at the University of Sheffield, and worked at CERN for my placement year.

## Technical Skills

- Programming** **Python (Advanced)** — Flask, PyTest, Nose, NumPy, Threading, Cython  
**Javascript (Intermediate)** — ES6, React, Browserify, Gulp, Node.js, Express, Require.js  
**Java (Intermediate)** — JUnit, JDBC, Swing, Eclipse  
**Others** — Haskell, PHP, HTML, CSS/less, basic Rust
- Software dev.** Familiar with TDD, Scrum, JIRA, Git and GitHub, Travis CI, Sphinx.
- Technologies** ELK stack, Redis, OAuth, MySQL, MongoDB. (Interested in RabbitMQ, Hadoop)
- Sysadmin** **Software** — Elasticsearch, Nginx, OpenSSL, SSH, Apache  
**Unix** — Debian, CentOS, OpenBSD, Arch, OpenSUSE, Gentoo  
**Linux kernel** — Filesystems, processes, scheduling, cgroups
- Computer Science** **Algorithms** — Complexity, searching and sorting, divide-and-conquer, heaps, RB trees  
**Machine learning** — Classifiers, clustering, neural networks, reinforcement learning  
**Databases** — Normal forms, relational algebra, SQL  
**Networking** — TCP/IP, DNS, HTTP/2, IPv6
- Mathematics** Game theory, optimization, Markov chains, probability, linear algebra, number theory.

## Selected Projects and Contributions

See also [github.com/jmacmahon](https://github.com/jmacmahon)

- 2016 **Timetables**, *ReactJS/Node.js*, Web app, Own project.  
Dashboard visualisation of live timetable data from the University of Sheffield.
- 2016 **HTTP2/Markov**, *Node.js*, Library, Own project.  
Predicting HTTP/2 server pushes with Markov chains. Abandoned due to lack of training data.
- 2015 **Syllabify**, *Haskell*, Phonotactic parser, Academic collaboration.  
Contributed to research for the International Association of Literary Linguistics' conference.
- 2014–2015 **CERN Document Server**, *Python*, Document storage, Contributions.  
Rewrote logging and analytics engine, using Elasticsearch, as part of a placement year at CERN.
- 2014–2015 **Lumberjack**, *Python*, Python library, CERN Project.  
Connect Python's logging library to an Elasticsearch backend.
- 2011– **Peano**, *OpenBSD/Debian*, Shared server, Own Project.  
General purpose server running OpenBSD and later Debian, used for mail (postfix/dovecot/roundcube), web (nginx/django), XMPP (prosody), IRC client
- 2012 **Wicd**, *Python*, Network Manager, Contributions.  
Support for 802.1X security for wired networks using wpa-supPLICANT, and associated GUI.

---

## Tech Work

- 2014–2015 **Technical Student Placement**, *CERN*, Geneva.  
Design and implementation of a new analytics engine for the CERN Document Server, based on Elasticsearch, Logstash, Lumberjack and Kibana.
- 2012, 2013 **Infodesk and Set-Up Volunteer**, *FOSDEM Conference*, Brussels, (Voluntary).  
Arriving early to set up rooms and networking, then dealing with queries and making sales.
- 2010–2012 **DF Webmaster**, *The Woodcraft Folk*, (Voluntary, Elected).  
WordPress administration and customisation, server migration and transition to nginx.

---

## Education, Qualifications and Awards

- 2015 **Advanced Python**, *CERN*, 4-day intensive course by Dr Jacek Generowicz.
- 2012– **BSc Computer Science and Mathematics**, *University of Sheffield*, Predicted 1st.  
Third year key modules: Software Engineering; Machine Learning; Neural Networks; Robotics;  
Second year key modules: Advanced Programming; Networks; Vector Spaces, Fourier Theory.
- 2009–2011 **AS and A-levels**, *Silverdale School*, Sheffield, A\*A\*AA(A).  
A-levels: Maths (A\*), Physics (A\*), Further Maths (A), Spanish (A); AS-levels: Chemistry (A)
- 2008 **Intermediate Mathematics Challenge — Gold certificate**, *UK Mathematics Trust*.
- 2006–2011 **National Cipher Challenge — First place (2007)**, *University of Southampton & GCHQ*.  
Team-based classical cryptanalysis; also came in the top 6 in 2009 and 2010.

---

## General Skills

- Teamwork** When working on the CERN Document Server, we were a team of 10 working in a Scrum environment to achieve goals such as a migration from MySQL to Elasticsearch.
- Communication** When working as Catering Manager for the Woodcraft Folk, I liaised with food wholesalers and camp leaders to resolve problems and settle invoices.
- Facilitation** I have led multiple workshops with the Woodcraft Folk and local campaigning groups, using Open Space and Consensus discussion techniques.
- Languages** Native English, conversational Spanish, some German and French.

---

## Other Work

- 2016 **Catering Manager**, *The Woodcraft Folk*, Derby.  
Coordinated food purchasing, delivery and distribution for a 7-night camp of 500 young people.
- 2014 **Listener**, *The Samaritans*, Sheffield, (Voluntary).  
Providing emotional support by phone, SMS and email with a large UK charity.
- Aug-Dec 2012 **Event Coordinator, Winter Wonderland**, *The Woodcraft Folk*, (Voluntary, Appointed).  
Working in a team planning all aspects of a residential event for 100 people.

---

## Interests

- Music** I am an amateur traditional musician, playing the tin whistle, flute and Uilleann pipes.
- Outdoors** I like to cycle, and go camping and hiking on frosty mornings in the Peak District.
- Linguistics** I have a keen interest in linguistics, in particular phonetics and dialectology.

---

## References

Available on request.