Joe MacMahon

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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, Broswerify, Gulp, Node.js, Express, Require.js
Java (Intermediate) — JUnit, JDBC, Swing, Eclipse
Others — Haskell, PHP, HTML, CSS/less
Want to learn — Rust, Golang, Erlang, Clojure

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
Operating Systems — Debian, RHEL, OpenBSD, Arch, OpenSUSE, Gentoo

Computer Science
Algorithms — Big-O notation, graph search, sorting, Hungarian algorithm
Machine learning — Dimensionality reduction (cosine, PCA), classifiers, clustering (sequential, heirarchical, k-means)
Databases — Normal forms, relational algebra, SQL

Mathematics Game theory, Markov chains, probability, linear algebra, number theory.

Selected Projects and Contributions

See also 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.

History   I'm interested in people's history over the last millenium, in particular, the European witch hunts and their economic impact.

References

Available on request.