

## James. M. Alvarez – Curriculum Vitae

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### **Research Software Development Experience**

*iOS Programmer, University of Sussex*

2016 - Present

- Developing iPad app to test for colour vision deficiency in children. Test is a SpriteKit based visual search game with various animation rewards. Accurate colour display managed efficiently using OpenGL shaders.

*MATLAB Programmer, University of Sussex*

2016

- Development of gaze contingent eye tracking psychophysics experiment for 4 month old infants with Eyelink, PsychToolbox & MATLAB.

*iOS Programmer, University of Sussex*

2016

- 'Synestheatre' iOS app, uses structure.io depth sensor to capture 2D depth data and render as real-time sound; a navigation aid for visually impaired. Parameters for depth to sound controllable with gestures and audio with CoreAudio C API.

*Freelance VR Programming Work, University of Sussex*

2016

- Rapid prototype of environment to present user motion capture as realistic avatar in Unity 3D environment. Participants wear VR headset (Oculus Rift) and see their actions applied to 3D avatar in first / third person.
- Creation of three VR based games / tests for eye function (Unity & Oculus Rift) random object search, catch game (using Leap Motion technology) and time telling.

*Senior Web Developer, University of Sussex*

2015 - Present

- Drupal / PHP / HTML5 development of web application providing backend for MULTISENSE Synesthesia research project. Users can upload custom experiments, storing results with API and download / share data with other researchers via groups.
- Users can integrate experiments with other platforms e.g. Qualtrics, as well as develop custom flows within studies to show tests dependent on results.
- Development of online / offline Javascript experiments to detect Synesthesia in children.

*Freelance Android Programming Work, Université Paris Descartes*

2015 - 2016

- Android application for Psychology field research. The application converted sensory events from hardware to real-time digital sound processing. It also allowed the experimenters to send messages to users phones via SMS / Bluetooth, to schedule tasks / adjust parameters, the results of which were sent to the experimenter's dropbox. Mostly written in Java, although due to the low latency sound requirement, the sound generation was written in C.

*Research Software Developer, SISSA (Italy)*

2014 - 2016

- New GUI and script parser for PsyScope written from scratch in Swift / Objective-C. PsyScope is used by many psychology academics to create multimedia experiments. Experiments are written in a declarative scripting language. The new GUI presents objects graphically, allowing users to create experiments without typing, whilst simultaneously updating script. Users can also create experiments via the script, which is parsed and converted into objects. The program is also designed for advanced users to write plug-ins, for new multimedia / sensor hardware.

*Research Software Developer, University of Birkbeck*

2013 – 2014

- Creation of interactive 3D learning environment in Unity3D (C#). The environment included several physics based / puzzle games with a child avatar helper. Eye tracker and SHORE facial expression recogniser were integrated for Autism research purposes. Included experience with 3D modelling / skinning / rigging. Involved interactive development via field testing with children in schools.

- Collaborative work on GraFIX Eye tracking analysis software specifically in the areas of file management, cross-platform compatibility, batch processing, and optimisation of algorithms (C++).
- Implemented fisher kernel learning algorithm (Machine learning) to analyse large eye movement database.
- Ubuntu server administration for dedicated psychology survey web server. Set up SSL, MySQL, scheduled backups, emails and installed and configured PHP web application 'Redcap', to allow collection of data securely.
- Tobii eye tracking Mex files for use by MATLAB programmers for childrens' eye-tracking research.
- Various eye tracking experiments written in MATLAB with PsychToolbox.

*Research Software Developer, University of Sussex* 2013 – 2014

- Programming colour research experiments for children in MATLAB
- Colour appearance modelling in MATLAB

*Data Analyst, Brighton and Hove City Council* 2012 – 2013

- ArcGIS Mapping (New cycle map + updated maps for various local amneties)
- Automated monthly analysis of traffic with VB scripts.
- Statistical analysis of public consultations.

*Freelance Programming / Data Analysis (within University of Surrey)* 2010 – 2012

- Bespoke experimental software for fMRI, EEG and Eye tracking (C++, C#, VB6)
- Scripting in Excel and Neuroscan for batch processing ERP data
- Undertaken throughout duration of PhD

### **Psychology Research Experience**

*PhD Student, University of Surrey* 2009 – 2012

- Exploring the interaction of colour words and perception
- EEG / ERP Data collection, scripting and analysis
- Behavioural experiments (e.g. visual search, threshold detection, XAB)
- Knowledge of colour spaces / colorimetry
- Programming experiments (C++, C#, VB6)

*Research Officer, University of Surrey* 2008 –2009

- ESRC funded project with Dr. Anna Franklin and Dr. Dianne Catherwood
- Investigation of hemispheric asymmetries in categorical perception of orientation in infants and adults
- Programming, collection and analysis of ERP Data
- Collected eye-movement and visual search data from adults and infants

*Research Assistant, University of Surrey* 2008 –2010

- Working on three separate social psychology projects with Dr. Julie Barnett
- Carried out UK part of an international survey investigating the effects of precautionary measures on the risk perceptions of mobile phone technology
- Conducted an in depth data analysis of data from a web tool designed to engage the general public in discussion on a scientific subject in collaboration with Prof. Chris Fife-Schaw and Prof. Richard Shepherd.
- Constructed on-line survey and analysed data based on precautionary advice with salmonella and future eating habits.

### **Academic Qualifications**

2009-2012 University of Surrey, PhD, 'An investigation of the influence of language on colour perception'  
 2007-2008 University of Exeter, Msc. Psychological Research Methods (Merit)  
 2003-2006 University of Nottingham, BSc. (Hons.) Psychology (2.1)