

Dr Louis McCallum

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About

With 11 years experience, I have excellent programming skills with a focus on multimedia applications and working in interdisciplinary, research-led environments. I am comfortable working in small or large teams in agile workplaces and have knowledge of and commitment to software development best practices. I can adopt new programming languages, libraries, and platforms easily and quickly and have experience of analysing, researching, and solving complex programming problems. I also have outstanding research skills including critical analysis and report writing.

Currently holding an academic position at the Embodied Audio Visual Interaction Group at Goldsmiths, London, I am researching feature engineering of motion sensor data for users of interactive machine learning software and building web frameworks to support musicians using machine learning. Before that, my most recent commercial post was as Senior Developer for London-based artificial intelligence firm HeresyAI, where I built out multiple propositions applying AI to the areas of music and video, sport and FinTech.

Freelance projects undertaken have included generative composition and remix, music information retrieval, gesture recognition, machine learning, electromechanical instrument design and construction, projection mapping, computer vision, augmented reality, concatenative synthesis, generative lyricism and digital sound design. This work, both individual and collaborative, have been widely exhibited across London, notably at the Royal Festival Hall, and in Dublin, New York and Austria. The robotic drummer I developed for my PhD, *Mortimer*, has appeared on the BBC's Christmas Lectures and on Channel Five's The Gadget Show.

I am currently teaching myself jazz piano and have just ran my sixth half marathon for charity, dressed in a tinfoil-heavy homemade robot costume.

Skills

Programming

Languages: Swift and Objective C (iOS and Mac), Java, C++, Python, Javascript, GLSL, Lua

Skills: Mobile Development and Distribution (iOS and Android), Machine Learning, User Centered Design, Multimedia Programming, Machine Listening, Computer Vision, Generative Music and Art, Code Reviewing, TDD, Scrum

Frameworks: Git/Bitbucket, Jira, Tensorflow, SuperCollider, OpenFrameworks, Processing, QT, Torch, BLE, Arduino, Max/MSP, FFmpeg

Production Techniques

Audio recording and mixing (Logic Pro, ProTools), Synthesis and Sound Design

Filming and Editing (Final Cut Pro), CAD (Rhino), Graphic Design (Sketch)

Full Employment History

From	To	Employer	Position and Responsibilities
12/18	-	Actress (Ninja Tune Artist)	AI Music Software Developer for Young Paint project. Used in performances for Transmediale 2019 in Berlin, Germany
05/18	-	Goldsmiths, University of London	Post Doctoral Researcher on MIMIC Project. Building a web platform for musicians to adopt cutting edge machine learning research into their practise
10/17	-	Goldsmiths, University of London	Post Doctoral Researcher in End-User Design of Sensor-based Interactions. Researching feature engineering for motion sensor data for users of interactive machine learning software. Developing software (Java), designing and conducting user studies, publishing output.
04/17	07/17	University of Sussex	Lead Mobile Developer, Synchonia Project. Developing iOS and Android application for distributing and performing musical scores. Involves bespoke and novel use of BLE and Direct WiFi between large numbers of cross platform tablets.
12/14	02/17	HeresyAI	Senior Developer. Developing software for new artificial intelligence propositions. Maintaining live releases and beta tests of iOS mobile applications (Mashtraxx Music and Video App, AiPex Tennis Sensor). Product design/concepts and business models. Graphic design for user interfaces. Supervising junior staff, interns and musicologists. Assisting with Patent Applications.
05/14	08/14	QMUL and Di Mainstone, Artist	Hardware Developer. Designing and building electromechanical beaters for Human Harp Project for Reverb Festival (Roundhouse).
09/13	07/14	Saint Digital, Digital Agency	Lead iOS Developer. Developing prototype location based social network/dating iOS app (Fayt).
05/13	07/13	QMUL and Keir Williams, Researcher	Java and Hardware Developer. Novel controller and software for research project, "Digital Media in a Special Needs Classroom".
08/12	03/13	The Technical People	Appcelerator Cross Platform Mobile Developer. Bespoke programming projects for iOS and Android (Trolleywise, QRCode Newspaper Scanner).
08/12	08/12	In The Woods, Art and Music Festival	OpenFrameworks and Hardware Developer. Building and installing interactive birdhouse/projection mapping installation.
07/12	08/12	Arthur Carabot, Designer	Onsite Technical Supervisor. Coca-Cola Interactive Beat Box Pavilion Installation for London Olympics.
07/12	09/12	Philter Digital Agency	SuperCollider Developer. Development of Algorithmic Composition driven by social bots (Weavrs) for Botstep and Whistling for Weavrs projects.
05/12	07/12	Richard Domenici, Artist	Hardware Developer. Designing and Building remote controlled mobile robot for Bomb Predisposal Unit project.

From	To	Employer	Position and Responsibilities
03/11	04/12	Helma Rudd, Artist	OpenFrameworks Developer. Software development and on site installation of large scale, interactive projection mapped sculpture in Klagenfurt Cathedral, Austria.
01/12	06/12	City Of London Boys School	Extracurricular Programming Teacher. Creating and delivering novel programming syllabus using Processing.
09/11	05/12	QMUL and Di Mainstone, Artist	Artist and Sound Designer. Construction and design of augmented water organ for Hydrocordian project, installation at Science Gallery (Dublin) and Eyebeam Gallery (New York).
02/11	08/11	United Visual Artists, Art Studio	Researcher. Research project in partnership with QMUL into mechanical instruments in interactive art installations.
09/09	05/10	University of Sussex	Peer Assisted Learning Tutor. Running of weekly support sessions for undergraduate students.

Education

PhD, Media and Arts Technology

Queen Mary, University of London, UK

Friend Me Your Ears: A Musical Approach to Human Robot Relationships

Oct 2011 - Jun 2015

Bachelor of Science First Class Honours, Music Informatics

University of Sussex, Brighton, UK

Oct 2007 - Jun 2010

Publications and Awards

McCallum, L.. and McOwan, P.W., *Extending Human-Robot Relationships Based in Music with Virtual Presence* December 2017

IEEE Transactions on Cognitive and Developmental Systems

- Journal Paper

McCallum, L. and McOwan, P.W., *Face the Music and Glance: How Nonverbal Behaviour Improves Human-Robot Relationships Based in Music* March 2015

ACM Human Robot Interaction Conference, Portland, OR

- Presented Paper

McCallum, L. and McOwan, P.W., *Shut up and Play: A Musical Approach to Engagement and Social Presence in Human Robot Relationships* August 2014

IEEE International Symposium on Robot and Human Interactive Communication

- Presented Paper, shortlisted for Best Paper Award

GRAGGGGGG:Generative Remix App Generator

Music Hackday, London

December 2011
w/Arthur Carabott

- Winner of EMI Sandbox API Prize

Show Us Your Screens

Computer Music Journal, MIT Press, Winter 2011, DVD supplement

Winter 2011
w/Davy Smith

- Documentary into Live Coding Practise

IWARP: Interactions with a Robotic Percussionist

Undergraduate Thesis

June 2010

- Winner of Best Artificial Intelligence Project, 2010

Released Software

Wekinator Motion Sender App

Companion mobile application for Wekinator machine learning software to transmit sensor data via OSC.

- iOS app, in store, open source.

CBMicro:Bit

Wrapper round CoreBluetooth to receive Micro:Bit button, pin and accelerometer data. Can be standalone as a Unix Executable, included in C++ projects or native Objective C apps (Desktop macOSX apps or iOS phone apps).

- Open source project.

Syncphonia Conductor and Performer Apps

Synchronised Score App for Amateur Ensembles.

- iOS and Kindle apps, in stores.