

CHARLIE HEWITT

Curriculum Vitae

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chewitt.me

## PROFILE

I'm a 23 year old computer scientist based in the UK. I recently graduated with a master's degree in computer science from the University of Cambridge and am hoping to pursue a career in research & development. I'm particularly interested in graphics, computer vision, human-computer interaction and machine learning. A portfolio of my recent work is available at [chewitt.me](http://chewitt.me).

## SKILLS

- Programming in Python, C#, C/C++, Java, MATLAB, Objective-C, Swift and SML/OCaml.
- Application of machine learning using tools such as SciKit, Keras, Torch and TensorFlow, primarily in the context of computer vision.
- Deploying software to a number of platforms including Windows, iOS and Android devices.
- Using HTML/CSS, PHP and JavaScript in the production of websites, including use of frameworks such as React, Angular, Bootstrap and Foundation.
- Source code management using Git.
- OpenGL shader programming in GLSL.
- Database management using SQL.
- Graphical design experience including UI, UX and icon design using Adobe Photoshop.
- Proficient user of Mac OS, Linux and Windows operating systems.
- Extensive experience with Microsoft Excel, as well as word processing including use of  $\text{\LaTeX}$ .

## EXPERIENCE

### RESEARCH ASSOCIATE - COMPUTATIONAL MEDIA INNOVATION CENTRE - 2019

Three month RA position at the CMIC, Victoria University of Wellington in New Zealand, working with researchers and industry partners to help develop innovative mixed reality technologies.

### RESEARCH INTERN - MICROSOFT RESEARCH - 2018

Six month internship at Microsoft Research in Cambridge, working with a small team to develop near-eye holographic display technologies for mixed reality.

### INTERN - CYDAR - SUMMER 2017

Two month internship working at Cydar in Cambridge, helping to develop imaging technologies for surgeons to use in the OR.

### INTERN - JAGEX GAME STUDIOS - SUMMER 2016

Three month internship within the web team at Jagex, focussed on projects involving the prototyping and development of potential future business opportunities.

### WEBMASTER - TRINITY HALL BOAT CLUB - 2014-2017

Maintaining and updating the club website ([trinityhallbc.co.uk](http://trinityhallbc.co.uk)), including complete website redesign, mobile compatibility update and implementation of online captancy election system.

## RESEARCH

### SHAPE-ONLY FEATURES FOR PLANT LEAF IDENTIFICATION - 2018

Charlie Hewitt, Marwa Mahmoud

Paper presenting a novel feature set for shape-only leaf identification from images based on spectral analysis of Local Area Integral Invariants. Over 90% accuracy is achieved on all but one public dataset, with top-four accuracy for these datasets over 98%.

#### CNN-BASED FACIAL AFFECT ANALYSIS ON MOBILE DEVICES - 2018

Charlie Hewitt, Hatice Gunes

Paper focussing on the design, deployment and evaluation of Convolutional Neural Network (CNN) architectures for facial affect analysis on mobile devices. The proposed architectures equal the dataset baseline while minimising storage requirements. A user study demonstrates the feasibility of deploying the models for real-world applications.

#### CONFIDENCE MEASURES FOR CNN CLASSIFICATION USING GAUSSIAN PROCESSES - 2018

Paper presenting a hybrid classification technique using Gaussian processes fitted on features extracted by a convolutional neural network to enable estimation of prediction confidence. The classifier is evaluated on the MNIST dataset and shown to have somewhat meaningful implications for confidence estimation.

#### PROCEDURAL GENERATION OF TREE MODELS FOR USE IN COMPUTER GRAPHICS - 2017

Project and associated dissertation produced for part II of the Cambridge BA course evaluating the effectiveness of Lindenmeyer-Systems and a fully parametric approach in producing realistic 3D models of trees for CGI. Implemented two systems in python for use with Blender, as well as an investigation of automatic design using genetic algorithms.

## EDUCATION

#### TRINITY HALL, UNIVERSITY OF CAMBRIDGE - 2014-2018

MEng (distinction - 87%) in computer science

BA (first class) in computer science

#### JOHN HAMPDEN GRAMMAR SCHOOL - 2007-14

A Level

- A\* in Mathematics, Further Mathematics and Chemistry
- A in Physics

AS Level

- A in Mathematics, Further Mathematics, Chemistry, Physics and Geography

Cambridge iGCSE

- A\* in Mathematics

GCSE

- A\* in Mathematics, Physics, Chemistry, Biology, Music, Industrial Technology, Geography, English Literature, French, Religious Studies (half course) and ICT (half course)
- B in English Language

## ACHIEVEMENTS / INTERESTS

- Treasurer for Trinity Hall June Event 2016 managing a budget of £150,000.
- Participant at Hack Cambridge Recurse 2017, producing an IoT mail sensor, and at Hack Cambridge Ternary 2018, producing a VR photo gallery with automatic captioning.
- Second place at Jane Street's eth0 hackathon 2015 and again at eth1 2016.
- Lower Boats Captain and coach for Trinity Hall Boat Club.
- Rowed and sculled as part of the first men's squad at Trinity Hall Boat Club.
- Winner of 'Most Promising Developer of 2015' and runner up 'Best Novelty Tweak of 2015' at the Jailbreak Awards 2015.
- JHGS Orchestra (2010-11), Jazz Band (2011-14) and Senior Jazz Band (2012-14).

## REFERENCES

Dr Andreas Georgiou  
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