Statistical 3D Shape Modelling of the Human Head in Partnership with Alder Hey Hospital
Department of Computer Science, University of York, UK

Qualification type: MSc (by Research)
Location: York
Funding for: UK citizens and EU citizens that have been resident in the European Economic Area for the past three years. Non-EU candidates will be considered for this studentship, but will be required to self fund the difference between the home and overseas tuition fees.
Duration: Funding is available for 12 months.
Funding amount: £14,553 for 2017/18
Hours: Full Time

Placed on: 7 July 2017
Closes: 31 August 2017

The project
The aim is to use a collection of 3D images of the human head to build a statistical models of human head (and ear/eye) shape and its variation through a population. Specifically, the type of models that we are interested in are called 3D morphable models (3DMMs), which consist of a mean shape and a set of principal modes of variation constructed from Principal Component Analysis (PCA). PCA requires alignment and normalisation of the dataset of 3D images and these processes can be made more effective by application of modern Machine Learning techniques, such as deep learning, in particular convolutional neural networks. Once built, the 3DMMs find applications in Biometric recognition, medical image analysis and computer graphics (avatars). Within the MSc, we aim to put the constructed 3DMM online so that it can be queried in a graphical interface. For example, when visiting a web page, one could click a pair of points on a human head model and the web page would then present population statistics on that particular measurement. Additionally, we aim to provide interfaces to the models so that they can be used by Craniofacial Clinicians, in particular we are collaborating with Christian Duncan at Alder Hey Children’s Hospital, Liverpool and we have linked in with their Headspace Project. The project is sponsored by a Google Faculty Award.
Research Supervision

If successful, you will conduct your research under the supervision of Dr Nick Pears, and you are likely to interact with other academics working in this area including Dr Will Smith and Dr Suresh Manandhar, in addition to several PhD students. Christian Duncan, head of the Craniofacial Unit at Alder Hey Hospital, Liverpool, will provide guidance on medical applications of the shape models.

Applicants

This MSc by Research is suitable for Computer Science (or related) graduates who are interested in the fields of Computer Vision and Machine Learning. Candidates should have a good first degree at Bachelors or Integrated Masters level in a suitable subject area, preferably Computer Science, but others will be considered, such as Electronics or Mathematics. Overseas applicants may apply but should have additional funding in place to top up to the overseas fee level (see below).

Award funding

If successful, you will be supported for 12 months. Funding includes:

- £14,553 (2017/18 rate) per year stipend
- Home/EU tuition fees

Funding requirements

To be considered for this funding you must:

- meet the entrance requirements for an MSc by Research
- be a UK/EU citizen*

*Non-EU candidates will be considered for this studentship but will be required to self fund the difference between the home and overseas tuition fees. At 2017/18 rate, the total difference equals £15525 (ie £19720 - £4195)
Apply for this studentship

1. Apply to study
You must apply online for a full-time MSc in Computer Science (by research) - [https://www.york.ac.uk/study/postgraduate/courses/apply?course=DRMCOMSSCI1](https://www.york.ac.uk/study/postgraduate/courses/apply?course=DRMCOMSSCI1)
You must quote the project title *(Headspace Online Studentship)* in your application.
There is no need to write a full formal research proposal (2,000-3,000 words) in your application to study, as this studentship is for a specific project.

2. Provide a personal statement
As part of your application please provide a personal statement of 500-1,000 words with your initial thoughts on the research topic.

Deadlines

The closing date for the receipt of applications is Thursday, 31 August 2017.
Interviews are expected to take place within approx. 14 days of the closing date.
The studentship will begin in October 2017.

Informal enquiries

Project enquiries
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Application enquiries
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