# Job Description – EPSRC DTP Internship: Exploring the architecture of our appearance using AI

*“EPSRC’s Vacation Internships scheme gives undergraduate students a taster of what it is like to do research. The students are given practical, first-hand experience of working on and carrying out research in a UK university.”*

Source: [Internships and placements – UKRI](https://www.ukri.org/councils/epsrc/career-and-skills-development/studentships/flexibility-for-funders/internships-and-placements/)

To be eligible for an EPSRC Vacation Internship you **must**:

* be an undergraduate or Masters student in a STEM subject area.
* not have completed your degree studies before the planned end of the internship. An internship should generally take place in the summer vacation **before** your final year of study.
* have a right to work in the UK and carry out the placement whilst resident in the UK. We are **not** able to sponsor visas for the internship.

**About the Role**

Our appearance is a major component of our social and personal identity. Human appearance is multi-faceted, with many different aspects such as skin colour, facial shape, body height, and so on. Researchers are using various methods to understand the biological basis of various aspects of our appearance. For example, many genes have been identified that explain the huge variability observed between ethnicities and also within any group of people. This directly has biomedical implications, e.g. knowing the genes for variability in skin colour also helps us to understand potential causes for vitiligo.

Underlying all this are mammoth efforts in generating data and analysing it with various statistical techniques. In particular, AI (artificial intelligence) and machine learning (ML) models have been popular approaches. However, understanding and interpreting the underlying architecture of complex AI models is challenging.

Our research group is working to understand how popular AI tools can represent our appearance, what is its inherent model of understanding, how diverse it is, and how it can be linked to various biomedical aspects including genetics. By joining this team, you’ll be able to support us in this research, its interpretation, writing the research findings, and public dissemination.

In this role, you will be working closely with a doctoral student in working with some ethnically diverse datasets, where you will quantify the extent of variation in some attributes such as skin colour, to assess the diversity of the datasets across characteristics. You will help in the application of various ML and AI models on these datasets, to assess if these models’ outputs have any inherent biases. You will also help to interpret the internal structures and outputs of these models with regard to the input and output data diversity. These tools will be made available to fellow researchers who are interested in working with a diverse, interpretable AI models for human volunteers, with applications in genomics, forensics, and medical data analysis.

The role will develop skills and experience in:

* Data science
* Interpretable AI and machine learning models
* Data privacy and ethics
* Teamworking
* Communication and engagement

**About the Unit**

The [School of Mathematics and Statistics](https://www5.open.ac.uk/stem/mathematics-and-statistics/home/welcome-school-mathematics-and-statistics?nocache=660d9de02d05c) has research groups in combinatorics, dynamical systems, complex analysis, history of mathematics, statistics, applied mathematics and mathematics education. The medical and genomic statistics group has multiple academics, doctoral students, research staff, and interns. This project’s research group has strong connections across the UK and internationally, in France, USA, India, Colombia, Chile, Brazil, Mexico, and Peru.

**Key Responsibilities**

* Data handling, analysis, and visualisation
* Working with sensitive data in a confidential manner
* Working as a team in understanding and interpreting the data and its findings

**Skills and experience**

Essential:

* Basic understanding of probability and statistics.
* Some familiarity with data analysis software (e.g. MS Excel / R / Python etc.)
* Access to a computer/laptop, the Internet and Microsoft Office applications.

Desirable:

* Some familiarity with programming.
* Some basic knowledge of biology or genetics (high school level) would be helpful to grasp the context of the problem easily, but is not essential.
* Prior knowledge of AI models is not necessary, but some awareness about them and their general use in society would be helpful to grasp the context.

If you would like further details about the role before making an application, then please email [stem-research-student-support@open.ac.uk](mailto:stem-research-student-support@open.ac.uk) quoting the reference number and job title.