Note: This job description does not form part of the employee's contract of employment but is provided for guidance. The precise duties and responsibilities of any job may be expected to change over time. Job holders should be consulted over any proposed changes in this job description before implementation.

Role Descriptors
Outputs and Requirements

Title: **Research Fellow (Ac2 Grade)**

Reports to: **Head of Department**

Department: **School of Computer Science and Engineering**

Professional Values

All Research Fellows are required to demonstrate respect for individual learners and be committed to incorporating the process and outcomes of relevant research, scholarship and/or professional practice. All Research Fellows are required to be committed to the development of learning communities and encouraging participation in Higher Education, while acknowledging diversity and promoting equality of opportunity. It is also a requirement that all staff are committed to undertaking continuing professional development and evaluation of individual practice and that they are proactive in improving the student experience

Role Purpose

We are seeking to appoint a Postdoctoral research associate to develop innovative image/video analysis and machine learning tools for quantitative assessment of the use of such techniques for early screening of dementia in the ageing British Sign Language (BSL) population. The Postdoctoral research associate will develop and apply this automated toolkit on two sets of data we already have collected and coded: 1) video recordings of 60 signers aged over 50 from 8 different regions of the UK in conversation and responding to interview questions; 2) video recordings as well as cognitive and language test scores on the BSL Cognitive Screen of 250 signers aged between 50 and 80, including signers with mild cognitive impairment and early stage dementia.

The successful candidate will implement the following main objectives:
1. Identify differences in sign space and facial expressions of signers, as a key to identifying dementia, by developing appropriate computer vision, neural-inspired (e.g., deep ANNs, deep RL) and pattern search algorithms. The methodology will be tested primarily with secondary sign language data (DCAL Research Data Archives) of older individuals – including those who

have normal scores on the BSL Cognitive Screen and those with atypical scores.

2. Define metrics for efficient vision-based perception that activates changes and determines the boundaries of the autonomy of the knowledge base (KB). The metrics should both improve existing knowledge, e.g., learn new patterns without forgetting previous ones, and identify whether new patterns are atypical or represent normal variation of individuals related to e.g., age or gender.

3. Iteratively validate the new knowledge incorporated in terms of classification accuracy (e.g., correcting classifications errors based on ground truth data), so as to limit the need to repeat the initial training phase.

Principal Accountabilities

1. To build internal contacts and participate in internal networks for the exchange of information and to ensure that relationships are made and developed for future collaboration (s) and potential sources of funds are identified.

2. To be able to prepare the paperwork required for the submission of research proposals and research applications to external bodies or companies to secure funding or for contractual purposes.

3. To take the initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio, identifying and using new research techniques and methods as appropriate to analyse and interpret research data and draw conclusions on the outcomes. Ensure that the outputs of such activities are to a standard that will be recognised internationally in terms of originality, significance and rigour.

4. To be responsible for conducting individual or collaborative research projects and ensuring that results are written up for publication.

5. To be able to use research resources, laboratories and workshops as appropriate and ensure that personal research activity is planned and managed, taking into account the requirement, as necessary, to collaborate with others, including both deaf and hearing colleagues

6. To be responsible for developing and maintaining a personal programme of Continuous Professional development (CPD) which ensures that you are continually up to date with developments, knowledge and understanding in your field or specialism and that you can translate this knowledge of advances in the subject area into research activity.

7. To attend and contribute to relevant internal and external meetings and to the decision making process in general, in a positive and collaborative manner.

8. To be involved and undertake the assessment of student knowledge, providing supervision of projects and assistance in the development of student research skills.

9. To have an understanding of individual health and safety responsibilities and an awareness of the risks in the work environment, together with their potential impact on both individual work and that of others.

10. To undertake any other duties within their competence, as required by the University.

CONTEXT

The post is funded by the Dunhill Medical Trust via the Research Project Grants (http://dunhillmedical.org.uk/). This project is in collaboration with the Deafness Cognition and Language Research Centre (DCAL) at UCL, and aims to improve early screening for dementia among ageing users of British Sign Language (BSL), thus enhancing understanding of changes in signing associated with acquired neurological impairment and those changes associated with normal ageing, and assisting clinicians who have limited knowledge about BSL to screen for dementia in Deaf people.

The Postdoctoral research associate will undertake high quality research in computer vision and neural-inspired (e.g., deep ANNs, deep RL) algorithms and systems. The Postdoctoral research associate will be expected to have an excellent background in machine learning and especially deep artificial neural network architectures, and computer vision methods such as predicting depth estimation from single camera recordings.

The Postdoctoral research associate will be part of a well-balanced, multi-disciplinary team, which includes Deaf and hearing experts from the areas of computer vision, machine learning, pattern and semantic search, and the linguistics of BSL, as well as cognition and neuroscience in Deaf people. The Postdoctoral research associate will be a member of the Cognitive Computing research group (C^2) based at the New Cavendish campus and the Deafness Cognition and Language Research Centre (DCAL) at UCL. The Postdoctoral research associate is expected to spend time both at Westminster and UCL. Advanced level programming skills using a variety of languages and platforms are expected. Deaf Awareness Training and instruction in BSL will be provided.

The Postdoctoral research associate will be expected to engage on a programme of continuous professional development (CPD).

The Postdoctoral research associate will be expected to actively participate as a member of the research team and have the ability to show consideration to others and liaise with other members of staff (academic, research and support). They will need to co-ordinate their own work with others to avoid either conflict or duplication of effort and be able to contribute to the decisions affecting the work of the team. The Postdoctoral research associate will be expected to deal with routine communication using a range of media and be able to communicate effectively.

The Postdoctoral research associate has responsibility for ensuring that suitable and sufficient risk assessments are undertaken for the activities for which they are

responsible and that measures to control risk are identified and implemented, and communicated to all affected.

They must ensure the provision of adequate supervision and training, to include: the responsibility to work with due regard for the health and safety of themselves and others; familiarity with actions to be taken in the event of emergency; and the duty to report accidents and hazards appropriately.

They will also require a thorough understanding of the diversity and equal opportunities issues.

DIMENSIONS
This is a Fixed Term appointment for 12 months in the first instance. Further funding to support the post may be available. This post is expected to start September 2018.

Person Specification
Research Fellow (Ac2 Grade)

	Essential	Desirable
Qualifications		
Degree (e.g., a good (1st or 2.1) undergraduate degree (or equivalent) in a relevant discipline with a particular interest in computer vision or machine learning.)	E	
Post-Graduate Degree or Professional Qualification	E	
PhD or the equivalent in professional qualifications and experience (e.g., in a subject relevant to machine learning or computer vision)	E	
Teaching Qualification		D
Qualifications in BSL		D
You will have proven experience and evidence of:-		
Proven record of successful experience in research	E	
Subject expertise that is up to-date	E	
Contribution to design of teaching or research		D

Experience of working with deaf colleagues/students		D
Skills High level analytical capability	E	
Fluent in relevant research models, techniques and methods and able to devise new ones	E	
Ability to communicate information clearly	E	
Ability to encourage commitment to learn in others		D
Ability to assess and organise resources		D
Understanding of and ability to contribute towards broader management issues		D
Communication skills in BSL or another sign language		D
Personal Attributes Fully committed to contributing to a stimulating learning and working environment which is supportive and fair, based on mutual respect and trust, and in which harassment and discrimination are neither tolerated nor acceptable.	E	