COMPUTER SCIENCE TRIPOS Part II – 2017 – Paper 7

9 Human–Computer Interaction (AFB)

This question relates to the design of interactive augmented reality applications. Consider a future application in which a (static) public billboard is augmented so that people passing in the street can see and modify an enhanced view, for example adding and editing caption text or speech bubbles over their personalised view of the billboard. This augmented functionality will be available either using hand-held mobile devices such as a touch-screen phone, or head-mounted displays such as Microsoft Hololens. Whichever type of device is used, users should be able to control the application either using hand gestures or gaze control.

(*a*) Discuss the requirements for sensor configuration and computer vision processing, to achieve the necessary detection and registration of the augmented interaction in *each of the four* possible combinations of the display and control methods described above. [8 marks]

(*b*) This part relates only to the head-mounted display version of the proposed product.

(*i*) Describe a technical approach that applies Bayes' theorem to improve the performance of command gesture recognition. [6 marks]

(*ii*) Describe a technical approach that applies Bayes' theorem to improve the performance of gaze-controlled text entry. [6 marks]