

8 Mobile and Sensor Systems (CM)

GoGo Ltd, a travel agent, wants to build a mobile phone app to support their customers' travel needs and to monitor their behaviour while travelling.

- (a) The company has built an app component that uses the phone microphone to detect customer context (e.g., noisy place, cafe ambience) as well as emotions from voice pitch. However, when used in practice by the customers, the accuracy of the detection is much worse than the one obtained in the laboratory environment. Give reasons of why this might happen and possible solutions to improve accuracy. [4 marks]
- (b) Discuss the privacy issues and possible alleviating mechanisms that can be employed when using the phone microphone in the app. [4 marks]
- (c) On mobile devices, power always comes at a premium. Describe how you would design the microphone sensing and inferencing to limit energy usage. [6 marks]
- (d) Customers are generally not keen to use data services abroad as roaming can be expensive. GoGo Ltd would like its app to offer a localised chat feature, allowing customers to send messages to each other without assuming any infrastructure.

Describe how you would design this component with considerations on MAC and networking layers. [6 marks]