

9 Further Human–Computer Interaction (afb21)

British houses are often wastefully heated even when there is nobody home. The problem is that it takes a long time to heat up to a comfortable temperature, and it is too difficult to program thermostats to account for the variable routines an occupant might have from one day to the next.

Imagine someone who owns an Internet-connected thermostat, a semi-autonomous car, and a voice-activated smart speaker. A generative language model fine-tuned for dialog, like the recently popular ChatGPT, could be used via the smart speaker to define a policy such that, on cold days, the heating will come on when the car will be returning home in about 30 minutes.

- (a) Complete the following voice dialog that might be used by this person to define the above heating policy for the next year.

USER: I want to define a new policy to control the  
central heating

BOT: What is the new policy?

USER: If the outside temperature is less than 10 degrees,  
use a special winter policy

BOT: What is the special winter policy?

[2 marks]

- (b) Which wave of HCI theory is most relevant to this interaction scenario, and why? [2 marks]

- (c) Suggest *four* cognitive dimensions that are relevant to the dialog. [4 marks]

- (d) For *each* dimension, explain:

(i) How this dimension is relevant to the voice dialog.

(ii) What its significance is in relation to the user’s goals.

(iii) How a voice dialog system might behave differently to improve usability on this dimension.

[12 marks]