Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

Faculty of Engineering, Mathematics and Science
School of Computer Science & Statistics

Integrated Computer Science **Hilary Term 2018**
B.A. (Mod.) Computer Science & Business
B.A. Management Science & Information Systems
Year 4 Annual Examinations

CS4051 - Human Factors

10 January 2018 **Goldsmith Hall** **14.00-16.00**

Dr. Gavin Doherty

Instructions to Candidates

Answer Question 1 and ONE other question

All questions are marked out of 50

Materials permitted in this examination:

None

All questions refer to the following passage:
A system is to be developed to support short term vehicle hire including cars and vans. Customers pay a monthly fee for access to the service, and an additional hourly fee for each booking. Fuel is included up to a daily limit, and an additional surcharge per kilometre applies beyond this. The geographic location of cars is tracked. The system operates in different cities around the world. When they first sign up customers must provide their payment details and a copy of their driving licence. Vehicles can be booked for periods of an hour or more using a mobile or desktop application. Vehicles are parked in designated parking spaces. After identifying the vehicle they have booked, customers can unlock the car using their mobile phone, and find the keys inside. Vehicles are generally returned to the same location where they are picked up. Some cities allow cars to be dropped off in a different location in the same city. The condition of vehicles is checked daily by staff, who report on any damage as well as conducting routine maintenance, checking that the vehicle has sufficient fuel, and refuelling if required. On finding a defect or damage to a vehicle on pickup, customers can report this. Customers can also report that they have caused damage to a vehicle or been involved in an accident, in which case an additional fee is payable. Customers can track their usage and any additional fees they have incurred. The company is expanding, constantly adding new locations; the staff of the company must also optimise the size and location of the fleet to maximise usage of each vehicle, based on usage data.

You may make reasonable assumptions about aspects of the system not described in the text above, but you must document these assumptions in your answer. Your answer should consider **all** users involved in the above system.

Q1. All candidates **must** answer this question.

a) Identify the main tasks in the above application and present an analysis of these tasks. Your analysis should go beyond a hierarchical task decomposition.

[35 marks]

b) Explain how your analysis would affect the design of the system, giving concrete examples of the design decisions which would be influenced by the analysis. You may use a small number of user interface sketches to illustrate your answer where appropriate.

[15 marks]

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Q2.

a) Describe an overall design process which you would recommend be applied in the development of the above system. Justify your choice. You should provide a plan for the activities but you do not need to consider timescales or person months.

[25 marks]

b) Identify three **usability metrics** relevant to the above system, explain why they are important, and how you would measure them. What values would you compare the measured results to?

[15 marks]

c) Explain the concepts **co-ordination mechanisms** and **awareness** (in a CSCW context) using examples from the above system.

[10 marks]

Q3.

a) Consider opportunities for error when using the above system, and describe how they might be detected, tolerated or recovered from. Make use of the SRK framework where it is helpful to your analysis and include user-interface sketches to illustrate your answer where appropriate.

[25 marks]

b) Discuss the advantages and disadvantages of **laboratory-based** vs. **field-based** evaluations with respect to the above system

[15 marks]

c) Discuss the importance of **external information representations** for supporting the people using the above system.

[10 marks]

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