

NED UNIVERSITY OF ENGINEERING & TECHNOLOGY

SECOND YEAR (COMPUTER SCIENCE & INFORMATION TECHNOLOGY/
COMPUTER SCIENCE SPECIALIZATION IN "CYBER SECURITY"/ COMPUTER SCIENCE
SPECIALIZATION IN "ARTIFICIAL INTELLIGENCE"/ COMPUTER SCIENCE SPECIALIZATION IN
"DATA SCIENCE"/ COMPUTER SCIENCE SPECIALIZATION IN "GAMING & ANIMATION")
FALL SEMESTER EXAMINATIONS 2024

Batch - 2023

Time: 3 Hours

Dated: 05-12-2024

Max. Marks: 60

ACADEMIC READING AND WRITING – EA-115

Note: Attempt all questions in your answer sheets.

Read the passage below and answer the given questions:

Driverless Cars

A. The automotive sector is well used to adapting to automation in manufacturing. The implementation of robotic car manufacture from the 1970s onwards led to significant cost savings and improvements in the reliability and flexibility of vehicle mass production. A new challenge to vehicle production is now on the horizon and, again, it comes from automation. However, this time it is not to do with the manufacturing process, but with the vehicles themselves.

Research projects on vehicle automation are not new. Vehicles with limited self-driving capabilities have been around for more than 50 years, resulting in significant contributions towards driver assistance systems. But since Google announced in 2010 that it had been trialling self-driving cars on the streets of California, progress in this field has quickly gathered pace.

B. There are many reasons why technology is advancing so fast. One frequently cited motive is safety; indeed, research at the UK's Transport Research Laboratory has demonstrated that more than 90 percent of road collisions involve human error as a contributory factor², and it is the primary cause in the vast majority. Automation may help to reduce the incidence of this.

Another aim is to free the time people spend driving for other purposes. If the vehicle can do some or all of the driving, it may be possible to be productive³, to socialise or simply to relax while automation systems have responsibility for safe control of the vehicle. If the vehicle can do the driving, those who are challenged by existing mobility models – such as older or disabled travellers – may be able to enjoy significantly greater travel autonomy.⁴

C. Beyond these direct benefits⁵, we can consider the wider implications for transport and society, and how manufacturing processes might need to respond as a result. At present, the average car spends more than 90 percent of its life parked. Automation means that initiatives⁶ for car-sharing become much more viable, particularly in urban areas with significant travel demand. If a significant proportion of the population choose to use shared automated vehicles, mobility demand can be met by far fewer vehicles.

D. The Massachusetts Institute of Technology investigated automated mobility in Singapore, finding that fewer than 30 percent of the vehicles currently used would be required if fully automated car sharing could be implemented. If this is the case, it might mean that we need to manufacture far fewer vehicles to meet demand. However, the number of trips being taken would probably increase, partly because empty vehicles⁷ would have to be moved from one customer to the next.

Modelling work by the University of Michigan Transportation Research Institute suggests automated vehicles might reduce vehicle ownership by 43 percent, but that vehicles' average

annual mileage double as a result. As a consequence, each vehicle would be used more intensively, and might need replacing sooner. This faster rate of turnover may mean that vehicle production will not necessarily decrease

E. Automation may prompt other changes in vehicle manufacture. If we move to a model where consumers are tending not to own a single vehicle but to purchase access to a range of vehicle through a mobility provider, drivers will have the freedom to select one that best suits their needs for a particular journey, rather than making a compromise across all their requirements.

Since, for most of the time, most of the seats in most cars are unoccupied, this may boost production of a smaller, more efficient range of vehicles that suit the needs of individuals. Specialised vehicles may then be available for exceptional journeys, such as going on a family camping trip or helping a son or daughter move to university.

F. There are a number of hurdles to overcome in delivering automated vehicles to our roads. These include the technical difficulties in ensuring that the vehicle works reliably in the infinite range of traffic, weather and road situations it might encounter; the regulatory challenges in understanding how liability and enforcement might change when drivers are no longer essential for vehicle operation; and the societal changes that may be required for communities to trust and accept automated vehicles as being a valuable part of the mobility landscape.

G. It's clear that there are many challenges that need to be addressed but, through robust and targeted research, these can most probably be conquered within the next 10 years. Mobility will change in such potentially significant ways and in association with so many other technological developments, such as telepresence and virtual reality, that it is hard to make concrete predictions about the future. However, one thing is certain: change is coming, and the need to be flexible in response to this will be vital for those involved in manufacturing the vehicles that will deliver future mobility.

Q. 01:

[CLO-1]

(a) Which section contains the following information?

(5 Marks)

Write the correct letter, A-G, matching 1-5 on your answer sheet.

1. Reference to the amount of time when a car is not in use. C
2. Mention of several advantages of driverless vehicles for individual road-users. B
3. Reference to the opportunity of choosing the most appropriate vehicle for each trip. E
4. An estimate of how long it will take to overcome a number of problems G
5. A suggestion that the use of driverless cars may have no effect on the number of vehicles manufactured. D

(b) Write the contextual meanings of the following words in the text. (5 Marks)

- a. Implementation
- b. Contributory
- c. Productive
- d. Autonomous
- e. Significant
- f. Initiatives
- g. Implications
- h. Intensively
- i. Regulatory

j. Enforcement

Q. 02: Answer the following questions.

[CLO-01] (10 Marks)

- What was the primary benefit of introducing robotic automation to car manufacturing in the 1970s?
- Why is automation in vehicles considered a potential solution to road safety issues?
- How might vehicle automation impact car-sharing and urban transportation needs?
- What is one potential effect of increased use of shared automated vehicles on vehicle manufacturing?
- What societal and regulatory challenges need to be addressed before automated vehicles can be widely adopted?

Q. 03:

[CLO-02]

(a) Read the above passage and write a concise summary that captures the main points and key information. Write a summary of the passage in no more than 200 words. Ensure your summary captures the main points about the Driverless Cars. (10 Marks)

(b) To what extent do you agree or disagree with the text where it says 'If a significant proportion of the population choose to use shared automated vehicles, mobility demand can be met by far fewer vehicles' Justify your answer with examples from your surroundings. (200-250 words (10 Marks)

Q:04 Using IEEE referencing style, how would you cite the following sources in the reference list:

[CLO-03] (10 Marks)

- "How would you reference the following conference paper in IEEE style for your bibliography?"

Author(s): Sarah L. Thompson and Kevin J. Miller

Title: "Innovations in Renewable Energy Storage"

Conference: IEEE International Conference on Energy Systems

Location: Berlin, Germany

Date: May 2022

Pages: 45-50

- "Using IEEE style, how would you reference this journal article in your bibliography?"

Author(s): Emily R. White, John P. Black

Title: "Quantum Computing: The Next Frontier"

Journal: IEEE Journal of Quantum Electronics

Volume: 58

Issue: 3

Pages: 101-110

Year: 2020

DOI: 10.1109/JQE.2020.9876543

- How should the following website be referenced in IEEE style?

Title: "Machine Learning in Modern Technology"

URL: <https://www.example.com/machine-learning>

Accessed Date: November 10, 2024

"How would you reference this book chapter in IEEE style?"

- d. How should the following book be referenced in IEEE style

Author(s): Michael R. Lee and Laura K. Brown

Chapter Title: "Data Security in IoT Devices"

Book Title: Advances in Internet of Things

Editors: Alice J. Green, Mark P. Rogers

Publisher: Springer

Pages: 25-45

Year: 2019

- e. Write the correct IEEE reference for the following technical report.

Author(s): David J. Martin

Title: "Cybersecurity Risks in Smart Grids"

Institution: National Institute of Standards and Technology (NIST)

Report Number: NISTIR 8200

Year: 2018

Q. 05: The bar chart below shows numbers of seals, whales and dolphins recorded in the Gormez Straits from 2006 to 2018.

Summarise the information by selecting and reporting the main features, and make comparisons where relevant.

Write at least 150 words.

[CLO-3] (10 Marks)

Write at least 150 words.

