Sustainable Data Science and Artificial Intelligence

Tutorial #1 – Part 1

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| **My Name:** |  |

**Instructions**

Some people in this class are bound to end up writing software for autonomous systems, including SmartCars, so it’s as well for you to think about some of the ethical dilemmas you might have to address, and there’s no point leaving this to someone else, you have a responsibility for the code you write, just because someone employs you to do it, doesn’t exonerate you from the responsibility.

What I want you to do is write the following for each of the five scenarios, present the two possible options that the scenario is giving you and then give your decision as to which you would do. I’ve done an example for the first one, and here’s the general format:

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***My Decision***: 40-100 words |

1. **The Classic AV Dilemma**

A self-driving car is approaching a crosswalk with five pedestrians. The only alternative is swerving into a barrier, which would kill the car’s passenger. Should the car prioritize the passenger or the pedestrians?

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| The two sides to the argument:  ***Option 1***: Hit the five pedestrians, potentially killing them all, killing some of them, or just injuring them. We don’t know who they are, they could be our family members, someone who is about to come up with a cure for cancer, or five wasters.  ***Option 2***: Swerve into a barrier and kill the car’s passenger, who is probably either the person who purchased the car, or related to them. This will ruin the reputation of the car supplier if it kills the owners of the car.  ***My Decision***: I think that I would have a hard time contributing to a software product that could kill the person who bought it under any circumstances, so for me, it would be best if I could write the system in such a way that it always took care of the purchaser of the SmartCar. |

1. **The Jaywalker Problem**

An autonomous car is driving within the speed limit when a single pedestrian suddenly jaywalks. The only way to avoid them is by swerving into oncoming traffic, potentially causing multiple casualties. Should the car follow traffic laws and prioritize legal road users?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***My Decision***: 40-100 words |

1. **The VIP vs. Public Dilemma**

A self-driving limo is transporting a world leader. Suddenly, a group of schoolchildren crosses the road unexpectedly. Should the car risk the leader’s life by swerving into a wall, or prioritize their safety over the children?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***My Decision***: 40-100 words |

1. **The Elderly vs. Young Dilemma**

The car can either hit an elderly person who is crossing legally or swerve into a young child who has run into the road. Should it prioritize age, legality, or randomness?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***My Decision***: 40-100 words |

1. **The Crowded Sidewalk Issue**

A brake failure occurs, and the only way to avoid crashing into a bus full of passengers is to swerve onto a crowded sidewalk. Should the car sacrifice the sidewalk pedestrians to save the bus passengers?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***My Decision***: 40-100 words |

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Tutorial #1 – Part 2

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| **Group**  **Members:** |  |

The following five scenarios are similar to the previous ones, except I want you to do these five in a group, so you have to figure out some way of getting consent within the group.

1. **The Two Smart Cars Standoff**

Two autonomous vehicles, each with passengers, are on a collision course due to an unpredictable event. Should they both try to minimize damage, or does one car have the right to self-preservation?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***Our Decision***: 40-100 words |

1. **The Environmentalist’s Dilemma**

The car must choose between hitting a pedestrian or swerving into a rare tree species that’s a key part of the ecosystem. Should it value human life over environmental protection?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***Our Decision***: 40-100 words |

1. **The Occupancy-Based Decision**

A self-driving bus with 20 passengers is on a collision course with a single motorcyclist. Should the car favour the larger number of lives, or is the individual’s right to safety just as important?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***Our Decision***: 40-100 words |

1. **The Law-Abiding vs. Moral Choice**

A pedestrian crosses on a red light. The smart car can follow traffic laws and keep going (hitting the jaywalker) or break the law to avoid them. Should AI always follow the rules, or should it make ethical exceptions?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***Our Decision***: 40-100 words |

1. **The Human Override Problem**

A smart car is about to make a life-or-death decision, but the human passenger has an override button. The car calculates that swerving will save more lives, but the passenger might selfishly prioritize themselves. Should the AI allow human intervention or act autonomously?

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| The two sides to the argument:  ***Option 1***: 20-50 words  ***Option 2***: 20-50 words  ***Our Decision***: 40-100 words |

**Submission Instructions**

Please submit in the following two ways

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| Please e-mail me your completed solution, and with filename:  *Familyname\_FirstName\_TU850\_1\_SDSaAI\_Tutorial1.docx*  e.g.  *Gordon\_Damian\_TU850\_1\_SDSaAI\_ Tutorial1.docx*  e-mail to [Damian.X.Gordon@TUDublin.ie](mailto:Damian.X.Gordon@TUDublin.ie) with subject heading as follows:  [DT850/1] SDSaAI Tutorial1 |
| Please submit into Brightspace in:   * Assessment   + Assignments     - Tutorial #1 |

For the email, please include the following message:

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| **Damian,**  **I am a student in your Sustainable DS & AI (CMPU1040) class in the BSc in DS & AI (DT850/1).**    **Please find attached Tutorial #1**  **Regards,**  **Your Name**  **Student Number.**  **DT580, BSc in DS & AI** |