Drones

or Unmanned Aerial Vehicles (UAVs)

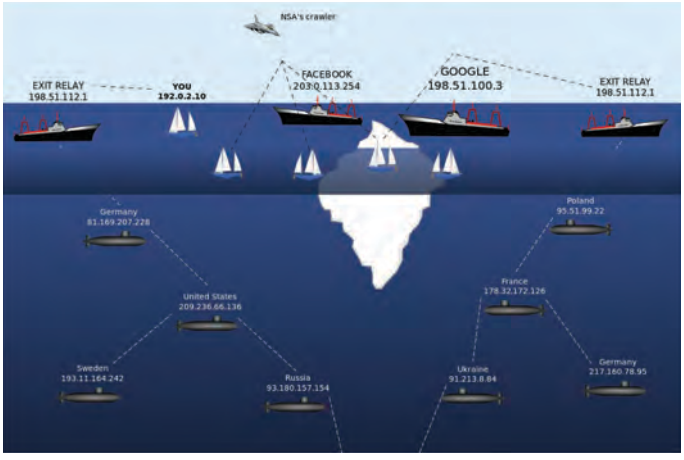
As an aeronautical, mechanical, materials or systems engineer, you could be offered a job in a company who are one of the makers of military unmanned aerial vehicles (UAVs) or, more popularly drones.

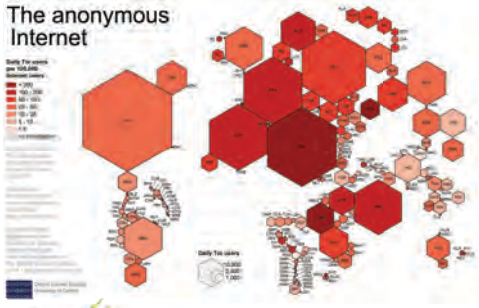
Since these vehicles have been used widely around the world in various theaters of warfare, particularly on the so-called “War on Terror”, do you believe that working for such a company would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject, I would like the group to discuss the following:

1. Does drone production give rise to ethical questions?
2. Would you work for a company that produces these devices?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.





The Dark Web

As a computer science and engineering graduate, you could be offered a job in in an IT company that specializes in so-called “Dark Net” protocols, examples include The Freenet Project and The Tor Project. While the idea of these projects is to provide peer-to-peer platform for censorship-resistant communication and as such, they use a decentralized distributed data storage to keep and deliver information. Although there are a wide variety of reasons for using such a system, there is concern that criminal enterprises take more and more advantage of the capabilities of the Dark Web..

Do you believe that working for a company that produces software that allows internet activity with a limited chance of oversight by governmental agencies holds any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of such software?
2. Would you work for a company that makes this software or develops applications with such software?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Radar Detectors

As an electrical or materials engineer, you could be offered a job in product development in a company that makes radar or laser/radar detectors. Many people believe that the sole reason to own such a device is to allow the owner to exceed the legal speed limits, i.e. to break the law.

Do you believe that working for a company that manufactured radar detectors would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of these devices?
2. Would you work for a company that produces these devices?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Vitamin Water

As an packaging or materials engineer, you could be offered a job in product development in a company that makes Vitamin Water or a similar “healthy” beverage. Many people believe that some companies go to extremes to emphasize “healthiness” and “good for you” when they mention their product. This “water” is essentially a sugar solution (over 32g per bottle).

Do you believe that working for a company that manufactured such solutions would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of these products?
2. Would you work for a company that produces these products?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Land Mines

As a mechanical, materials or electrical engineer, you could be offered a job in product development in a company that makes anti-personnel mines. These weapons have been deployed widely in war zones around the world and often they are not removed after a conflict. As an example, in the Falkland Islands in the South Atlantic, where Great Britain and Argentina fought a war nearly 30 years ago, there are an estimated 20,000 land mines still buried in the often marshy ground of the islands.

While there is an international campaign to ban land mines, which lead to the Ottawa Treaty in 1997, a number of countries do not accept or support the treaty, including Russia, China, Pakistan, India and the USA. Do you believe that working for a company that manufactured land mines would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of these devices?
2. Would you work for a company that produces these devices?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Handguns

As a mechanical, materials or
structural engineer, you could
be offered a job in product development in a company that makes handguns. In this country, handguns are an entirely legal product, however, they are principally designed as anti-personnel devices. These weapons are so common that Federal statistics from 2009 estimated that there are more handguns in the country than people.

Do you believe that working for a company that manufactured hand guns would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of these devices?
2. Would you work for a company that produces these devices?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Genetically Modified Foods

As a packaging engineer you could be offered a job in product development or packaging in a company that makes produces and markets genetically modified foodstuffs. In this country, GMO products are legal and not regulated, but there is a good deal of consternation about GMO food and produce in some groups. It should be noted that, whilst almost ALL food has been genetically modified over the centuries, it is only in recent years that direct gene and cell manipulation have enabled rapid modification and some say “unnatural” developments. There is little proof that GMO food can damage human health, and studies to determine this absolutely may take decades or generations

Do you believe that working for a company that manufactured GMO products would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of these products?
2. Would you work for a company that makes these products?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Napalm

As a chemical engineer, you could be offered a job in a company that makes chemical weapons. An example might be Napalm, essentially a mixture of a thickening/gelling agent and petroleum, or a similar high volatility fuel, that is used in certain incendiary devices. It was initially used against buildings, and later was used primarily as an anti-personnel weapon that sticks to skin and causes severe burns when on fire.

Since this product was widely used by the United States in the controversial Viet Nam War, it is a product that tends to incite strong emotions. Do you believe that working for a company that manufactured napalm would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of this material?
2. Would you work for a company that produces these incendiary devices?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Cigarettes

As a mechanical, materials or packaging engineer you could be offered a job in product development or packaging in a company that makes cigarettes. In this country, although an entirely legal product, cigarettes have become very unpopular with some people and they are banned in many locations. This is principally because it has been shown that prolonged use or exposure to cigarette smoke can damage human health.

Do you believe that working for a company that manufactured cigarettes would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of these products?
2. Would you work for a company that makes these products?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Sarin

(*RS*)-Propan-2-yl
methylphosphonofluoridate

As a chemical engineer you could be offered a job in a chemical company developing and producing a weapon of mass destruction that is abhorrent to most people.

Do you believe that working for a company that made chemical weapons would present you personally with an ethical dilemma?

Since there may be two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with producing chemical weapons?
2. Would you work for a company that produced chemical weapons?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Diamonds

As a materials, civil, environmental or mechanical engineer, you could be offered a job in production and polishing of gem diamonds. While the majority of diamond production is legal and not the result of conflicts/wars (so-called conflict, blood or diamonds). The blood diamond trade has funded many bloody, costly and horrifying wars in western Africa in recent years. In addition, the diamond industry is mostly controlled by a cartel of companies that go under the name De Beers. Many people consider their activities exploitive.

Do you believe that working for a company that produced diamonds would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the production of these products?
2. Would you work for a company that makes these products?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

Gold

As a materials, mechanical, civil, environmental or mining engineer you could be offered a job in the mining, extraction and refining of gold. Although most mining is done by large multinational corporations, there are a large number of small groups and individual engaged in production. The large corporations are often accused of using completely environmentally irresponsible techniques for mining (use of mercury, sluicing, etc,).

Do you believe that working for a company that mined gold would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject I would like the group to discuss the following:

1. Do you have ethical issues with the mining of gold?
2. Would you work for a company that mined gold?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.

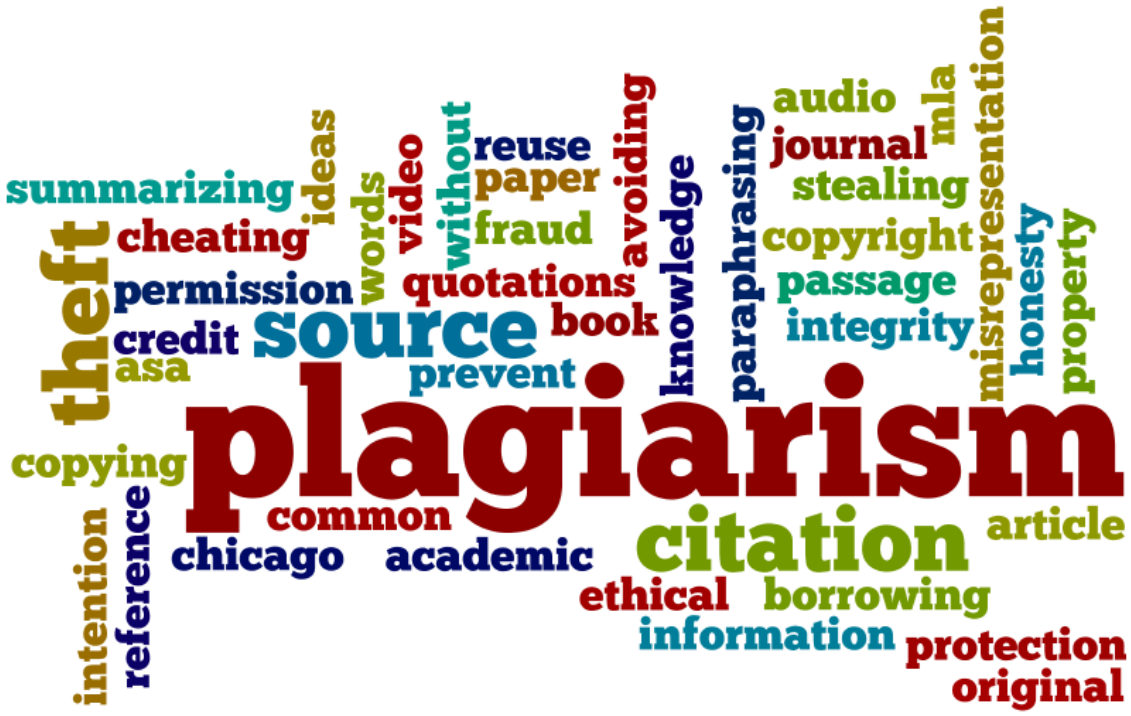
Human Genomics

As an biomedical engineer, materials engineer or chemical engineer, you could be offered a job in a company who sequence, manipulate and synthesize human genetic material in order to make create treatments for a wide variety of diseases and genetic abnormalities. They always seek to patent their discoveries, even when the genetic material resides within a living human being. Do you believe that working for such a company would present you with any ethical dilemmas?

Since there are likely to be at least two opposing opinions on this subject, I would like the group to discuss the following:

1. Does human genetic manipulation and patenting give rise to ethical questions?
2. Would you work for a company that operates in this area?
3. Can you justify your point of view?

In your discussion group, there should be one person for each point of view who is prepared to stand up and summarize their views and the reasoning behind them.



Academic Dishonesty

As a student and researcher you may witness academic dishonesty by a fellow student or researcher. What would you do if you found that a fellow graduate student plagiarized part of the Introduction of a paper that you are a co-author? The plagiarism is only the introduction that describes the experiment that your research group has used for years and is standard “boiler-plate” description. You know that the text is essentially verbatim from a paper published by a previous post-doc in the group and that person is a co-author on the new paper as well.

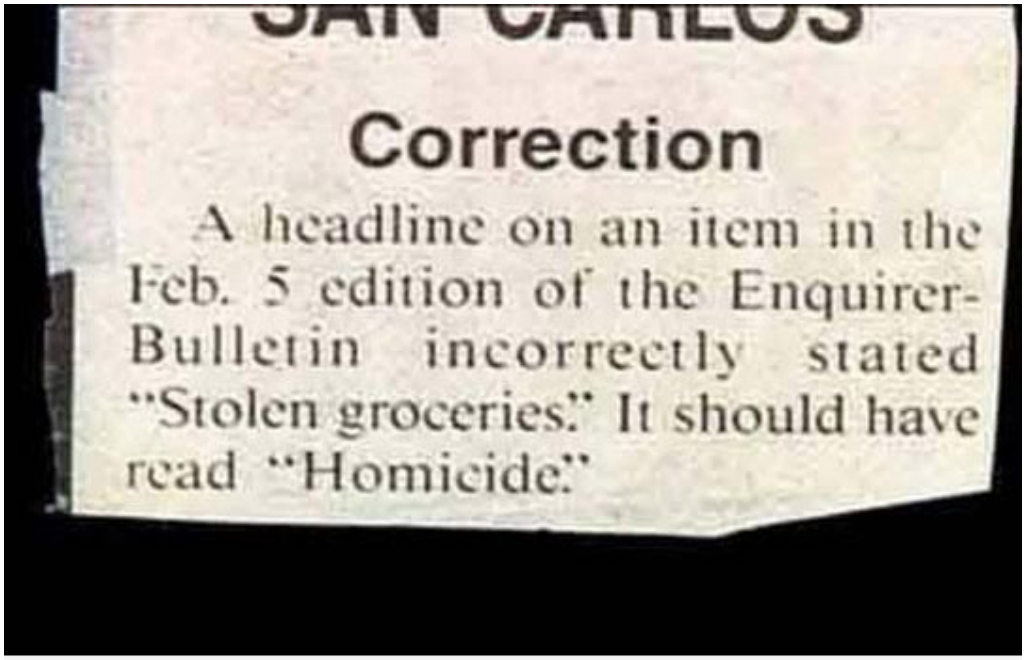
Please discuss in your group the following:

What is your role in “policing” academic and research dishonesty?

Is this really plagiarism?

What if you then go through some of your research groups other papers that have already been published prior to you joining the research group and see that many of the Introductions are essentially the same text from the first paper your Research Advisor published. What would you do about this discovery?

If you were asked to referee a paper from a competing group and noticed the same type of “self-plagiarism”, what would you do?



Honest Mistakes

Mistakes happen. Even the most careful engineer and scientists make mistakes, though one of the goals of being careful is always double checking and working with your colleagues to help uncover errors prior to publication.

You are working under a tight deadline to produce results from an experiment that you need for a chapter of your thesis and publication in a special issue of a journal devoted to “extreme” parameter space. You have presented preliminary data to your advisor and research group and even presented the results at a national meeting. In running the new experiment, you discover a bug in the data processing code that doesn’t impact most of the work, but for the extreme (and most interesting) range of parameter space, the bug completely invalidates the results. The Thesis Deadline and the special issue deadline is this week.

Please discuss with your group the following:

What do you do? Eliminate the “very interesting” results? Include the results but put a note in the Thesis and paper about the “uncertainty” in the “special” results? Tell your advisor about the bug and that you don’t have time to redo the analysis of that section of parameter space and therefore will not be able to submit the paper to the special issue? The aspect of the research is important, but not the central aspect of your Thesis. Should you delay your dissertation to redo the analysis?