Major Assessment

TNE30009

You are to choose one of the following topics to write a 2500 word research report on.

1. The Industrial Internet of Things is a fundamental part of Industry 4.0, claimed to be the next industrial revolution. The IIoT has strict timing requirements, deals with potentially dangerous machinery and operate in noisy and potentially hazard environments. What security issues does the IIoT present?
2. Satellite Systems are undergoing dramatic developments with low cost CubeSats extending the possibilities of satellite communications so that an Internet of Satellites (IoSat) has been proposed. However, satellites operate over links with very long latencies and low bandwidths, signal power for communications is limited and space is a very hazardous environment for electronic equipment with no possibility of maintenance and regular solar storms. What security issues does the IoSat face?
3. BGP is surprisingly fragile and has been the source of many security failures in the past few decades. Why is it so fragile? What efforts have been made to improve its robustness?
4. Quantum computing threatens to upend our assumptions as to how secure commonly used cryptographic algorithms are. Consequently, there has been much work in making algorithms "Quantum-Safe". Why is quantum computing such a threat? How can algorithms be made "quantum safe"? What approaches have been adopted to ensure new algorithms are quantum safe?
5. Anomaly detection is an ongoing research area of great importance for many areas of security. However, detecting anomalies in datasets with many attributes is problematic because of "the curse of dimensionality". What approaches have been developed to detect anomalies in datasets with many attributes? How effective are they?
6. Topic of your own choice but you must discuss it with the convenor beforehand.

For your chosen topic you are to answer the following questions:

- What security frameworks and protocols have been developed?
- What problems do the frameworks and protocols attempt to resolve?
- What issues are still unresolved?
- For the unresolved issues, what are some of the approaches being considered?

You are to format your report using IEEE conference template.

The report is due at the end of the second week of the Exam period.

The report is to be no more than 2500 words (excluding references). It will be assessed based on criteria listed in the following table.

	Pass	Credit	Distinction	High Distinction
Format (10%)	•The submitted report is formatted using the IEEE Conference template • All figures/tables are appropriately labelled • The submitted report is in PDF format			Pass requirements plus Formatting is clean with no words/tables wrapping beyond the edge of a column/page
Structure (20%)	• The submitted report is properly structured in the format of an IEEE paper including Abstract, Introduction, Relevant sections and Conclusion • The topic is divided into a simple but clear structure	Pass requirements plus: • Clear use of sub-sections as required to clearly delineate different aspects of the topic • The reference list is professionally structured and complete	Credit requirements plus: • All sections have a sufficient level of detail	Distinction requirements plus: • Suitable references have been located and used for all claims made in the paper

	• A reference list is provided			
Research Analysis (50%)	• Some discussion of relevant material but overall an incomplete evaluation of the area with only limited discussion on the issues raised	Pass requirements plus: • A clear evaluation of the problem researched • Some discussion of the issues raised in relation to the rest of the report	Credit requirements plus: • A thorough evaluation of the research problem • A complete analysis of the issues raised in the report • An attempt to use existing literature to support your argument	Distinction requirements plus: • The paper demonstrates a deep understanding of the area and presents an in-depth evaluation of the research problem. • A sophisticated and thorough analysis of the issues raised with evaluation of the strengths and weaknesses of different facets of the topic • Good use of existing literature to support your argument • Suitable for submission to an Academic conference or journal
Language (20%)	• Basic language and grammatical skills	Pass requirements plus: • Good grammatical structure and flow of argument	Credit requirements plus: • A document suitable for reading by a professional audience	Distinction requirements plus: • An excellent report suitable for reading by an Academic audience